WILDWOOD WAYS

WINTHROP PACKARD

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WILDWOOD WAYS

The muskrats have built higher than common this year

WILDWOOD WAYS

BY

WINTHROP PACKARD

AUTHOR OF "WILD PASTURES"

BOSTON

SMALL, MAYNARD AND COMPANY

PUBLISHERS

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THE UNIVERSITY PRESS, CAMBRIDGE, U.S.A.

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THE author wishes to express his thanks to the "Boston Transcript" for permission to reprint in this volume matter which was originally contributed to its columns.

M350020

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SNUGGING-DOWN DAYS

SUGGESTED-DOWN DATE

SNUGGING-DOWN DAYS

TO-DAY came with a flashing sun that looked through crystal-clear atmosphere into the eyes of a keen northwest wind that had dried up all of November's fog and left no trace of moisture to hold its keenness and touch you with its chill. It was one of those days when the cart road from the north side to the south side of a pine wood leads you from early December straight to early May. On the one side is a nipping and eager air; on the other sunny softness and a smell of spring. It is more than that difference of a hundred miles in latitude which market gardeners say exists between the north and south side of a board fence. It is like having thousand

league boots and passing from Labrador to Louisiana at a stride.

On the north side of a strip of woodland which borders the boggy outlet to Ponkapoag Pond lies a great mowing field, and here among the sere stubble I stand in the pale shadow of deciduous trees and face the wind coming over the rolling uplands as it might come across Arctic barrens, singing down upon the northerly outposts of the timber line. On the south side the muskrat teepees rise from blue water at the bog edge like peaks of Teneriffe from the sunny seas that border the Canary Isles. Such contrasts you may find on many an early December day, when walking in the rarefied brightness of the open air is like moving about in the heart of a diamond.

Yet even the big mowing field shows unmistakable signs of having been

snugged down for the winter. Here and there a tree, still afloat in its brown undulating ocean, seems to be scudding for the shelter of the forest under bare poles, while the stout white oaks lie to near the coast under double-reefed courses, the brown leaf-sails still holding to the lower yards while all the spars above have been blown bare. The woodchuck paths, that not long ago led from one clover patch to another and then on to well-hidden holes, lie pale and untravelled, while their fat owners are snugged down below in warm burrows with their noses folded in under their forepaws. Tradition has it that they will wake in a warm spell in midwinter and peer out of their burrows to see what the prospect of spring may be. Hence, the second of February is not only Candlemas day, but ground-hog day in rural tradition, the

day on which the woodchuck is fabled to appear at the mouth of his underground retreat and look for weather signs, but I don't know anyone who has ever seen him do it. You may often find skunk tracks in the snow or mud during a good midwinter thaw, but I have never seen those of the woodchuck then, and I am quite confident that he stays snugged down the winter through.

Scattered here and there about the borders of the field are groups of dwarf goldenrod still in full leaf and flower, so far as form goes. The crowded terminal panicles of bloom bend gracefully towards earth like stout ostrich plumes, and I think they are more beautiful in the feathery russet of crowded seed-masses than they were in their September finery of golden yellow. Their stems are lined with leaves still, but these have

lost their sombre green to put on the color of deep seal brown. It is as if they had donned their sealskin cloaks for winter wear.

But all these clumps are doubly protected in another way, not for their own sake, for they are but dead stems, but for the birds, who will need their seeds when the snows later in the month shall have covered the ground far out of their reach. All the autumn the winds have been whirling dry leaves back and forth, and each clump has trapped them cunningly till the slender stems that might otherwise be buried and broken by the snow are reënforced on all sides by elastic leaves that will hold them bravely up. Here is an open larder, a free-lunch counter for the goldfinches and chickadees of next January. Here they may glean and glean again, for except they

be plucked by eager beaks some of these seeds will not let go their grip on the receptacles till spring rains loosen them and the ground is fit for their sowing.

Everywhere in wood and pasture the numbers of seeds of plants and trees that are thus held waiting the winter gleaners are incomputable; nor will these need to seek them on the plant itself, for little by little as the winter winds come and go they will loose their hold and scatter themselves about as we scatter crumbs for the snow-birds and sparrows. Here are the birches, for instance, holding fast still to their wealth. If bursting spring buds could be gray-brown in color instead of sage-green we well might think the trees had another almanac than our own and that with them it was late April, for wherever the trees are silhouetted against the light we

see every twig decorated with new life. It is new life, indeed, but not that of spring leaves. Every tree has a thousand cones, and every cone is packed with tiny seeds about a central core of stiff fibre that is like a fine wire.

Holding the seeds tight in their places are little flat scales, having an outline like that of a conventionalized fleur-de-lis or somewhat like tiny flying birds. The whole is so keyed by the tip that as they hang head down it is possible to dislodge only the topmost scales and seeds. A very vigorous shake of the tree sends a cloud of these flying, but when you look at the tree you find that not a thousandth part of its store has been dispensed. When the midwinter snows lie deep all about, the paymaster wind will requisition these stores as needed for the tiny creatures of the wood and scatter

them wide on the white surface, till it will look as if spiced by the confectioner, so well does the forest take care of its own. The Lady Amina of the Arabian tale picking single grains of rice at the banquet might not seem to dine more daintily. The spring will be near at hand when the last of these birch seeds will have been dispensed. Thus innumerable graneries are stored the woodland and pasture through, so lightly locked that all may pilfer, and so abundantly filled, pressed down and running over that there shall be no lack in either quantity or variety.

Far other and stranger forms of winter-guarding forethought are to be seen all about the big mowing field and in the coppices that divide it from the open marsh and the pond shore, if we will but look for them. In many places

has witchery been at work as well as forethought, and strange and unaccountable things have been brought to pass that tiny creatures may be kept safe until spring. Here and there among the goldenrod stems you find one that is swollen to the size of a hickory nut, a smooth globe which is merely the stem expanded from the diameter of a toothpick to three-quarters of an inch. When I split this bulb with my knife I find it made up of tough pith shot through with the growing fibres of the plant, but having a tiny hollow in the centre.

Here, snugly ensconced and safe from all the cold and storms, is a lazy creature so fat that he looks like a globular ball of white wax. Only when I poke him does he squirm, and I can see his mouth move in protest. His fairy language is too fine for my ear, tuned to the rough

accents of the great world, but if I am any judge of countenances he is saying: "Why, damme, sir! how dare you intrude on my privacy!"

After all he has a right to be indignant, for I have not only wrecked his winter home, but turned him out, unclothed and unprotected, to die in the first nip of the shrewish wind. Unmolested he would have leisurely enlarged his pith hall by eating away its substance and in the spring have bored himself a cunning hole whence he might emerge, spread tiny wings and enjoy the sunshine and soft air of summer. His own transformations from egg to grub, from grub to gall-fly, are curious enough; yet stranger yet and far more savoring of magic is the growth of his winter home. By what hocus-pocus the mother that laid him there made the slender stem of the

goldenrod grow about him this luxurious home, is known only to herself and her kindred, and until I learn to hear and translate the language which the grub used in swearing at me when I broke into his home, it is probable that I shall still remain ignorant.

But let us leave Labrador and let ourselves loose upon Louisiana, for we may do it in five minutes. The oaks and the pines, the maples, the birches and the shrubs of the close-set thickets which guard the bog edge, I know not what straining and restraining power they have upon this keen wind, but when it has filtered through them it has lost its shrewishness and, meeting the warm embrace of the low hung sun, bears aromas of spring. It is as if wood violets had shot his garments full of tiny odors of April as he traversed the wood, or per-

haps the perpetual magic of life which seems to well up from swampy woodland had seized upon him as it seizes upon all that passes and made him the bearer of its potency. Across the bog to the pond outlet, through this spring-soft atmosphere lies a slender road, lined with thickets, where I do not wonder the *Callosamia promethia*, the spice-bush silkmoth, likes to spin his own winter snuggery and dangle in the soft air till the real spring taps at his silken doorway and soft rains lift the latch and let him out.

Not far away, among the leaves that lie ankle deep among the shrubbery that skirts the hickories and oaks, are the cocoons of *Actias luna;* among them, shed from the oaks, are those of *Telia Polyphemus*, and if I seek, it is not difficult to find the big pouch where *Samia*

cecropia waits for the same call. Some May evening there shall be a brave awakening in the glades and on the borders of the bog. It shall be as if the tans and pinky purples and rose and yellow of the finest autumn leaves took wing again in the spring twilight and floated about at will owing nothing to the winds, and then the luna moth, the fairy queen of dusk, all clad in daintiest green trimmed with ermine and seal and ostrich plumes, shall come among them and reign by right of such beauty as the night rarely sees, all this sprung from the papery cocoons swung in the roadside bushes or tumbled neglectfully among the shifting autumn leaves in the tangle at the roots of the wild smilax.

Here is magic for you, indeed, of the kind that the parlor magician is wont to supply; frail and beautiful things grown

at a breath, almost, from obscure and trivial sources. Yet I seem to find a more potent if less spectacular witchery in what has been done to the willows that here and there grow in the thicket that borders the slender bog road. Some winged sprite has touched their branch tips with fairy wand and whispered a potent word to them, and the willows have obeyed and grown cones! These are an inch or more in length and as perfect with scales as those of the pines up in the wood. But there are no seeds of willow life in them. Instead there is at the core an orange-yellow, minute grub, the larva of a fly that stung the willow tip last spring and, stinging it, laid her egg therein.

That the egg should become a grub and that later the grub in turn should become a fly is nothing in the way of

magic, or that it should fatten in the meanwhile on willow fibre. The necromancy comes in the fact that every willow tip that is made the home of this grub should thenceforth forsake all its recognized methods of growth and produce a cone for the harboring of the grub during the winter's cold. There are many varieties of these gall-producing insects. The oaks still hold spherical attachments to their leaves, produced in the same way. Look among your small fruits and you will find the blackberry stems swollen and tuberculous from a similar cause, and full of squirming life. It is all necromancy out of the same book, the book of the witchery of insects that makes human life and growth seem absurdly simple by comparison. The snugging down of the open world in preparation for winter is full of such tales, and he who runs

through the wood on such a day in December may read them.

Standing in the spring-like warmth at the pond outlet and looking down the line where bog meets water I can count the dark peaks of the muskrat teepees, receding like a coast range toward the other shore. The muskrats have built higher than common this year, because, I fancy, they expect much water, having had it low all summer and fall. Some of them are half as high as I am and must have cost tremendous labor in tearing out the marsh roots and sods and collecting them thus in pyramidal form. Their roads run hither and yon across the bog and are so well travelled that the travellers must be numerous as well as active. They have laid in a store of lily roots and sweet-flag for the winter, and their underwater entrances lead upward to

quarters that are dry and snug. Here they are as secure from frost as was the white grub that I hewed from his pith hall in the goldenrod stem. When the ice is thick all about, their house will be as hard of outside wall as if built of black adamant yet their water-entrance will be free, beneath the ice, and they will go to and fro by it, seeking supplies or perhaps making friendly calls.

All the morning the marsh grass billowed and the water sparkled, one to another, about their houses, and if you listened to the grass you might hear its fine little sibilant song, a soft susurrus of words whose only consonant is s, set to a sleepy swing. It is a song that seems to harmonize with the fine tan tones of the bog as they fade into silvery white where the sun reflects from smooth spears. Over on the distant hillside the

pines, navy blue under cloud shadows, hummed in the wind like bassoons; distant and muted cornets sang clear in the maples, and all about the feathery heads of the olive swamp cedars you caught the faint shrilling of fifes if you would but listen intently. Now and then the glocken-spiel tinkled in mellow yellow notes among the dry reeds on the marge, but these echoed but familiar runes. The tan-white bog grass that is so wild it never heard the swish of scythe, sang, soft and sibilant, an elfin song of the lonely and untamed.

With the singing of the wind into the tender spring of the south side the day grew cold with clouds. The sky was no longer softly blue, but gray and chilling, the pond lost its sparkle and grew purple and numb with cold, and all among the bare limbs you heard the song of the

promise of snow. But the clouds stopped at a definite line in the west and at setting the sun dropped below this and sent a golden flood rolling through the trees that mark the boundary between field and pond, lighting up all the bog with glory and gilding the muskrat teepees and the tall bog grass and the distant trees across the water till all the sere and withered leaves were bathed in serenity, as softly and serenely bright as if the golden age had come to us all. In this wise the crystal day, with its sheltered exultation of spring and its gray promise of winter's snow all fused into one golden delight of sunset glory, marched on over the western hills trailing paths of gilded shadow behind it along which one walked the homeward way as if into the perfect day.

CERTAIN WHITE-FACED HORNETS

CERTAIN WHITE-FACED HORNETS

THE lonesomest spot in all the pasture, the one which the winter has made most vacant of all, is the corner where hangs the great gray nest of the white-faced hornets. Its door stands hospitably open but it is no longer thronged with burly burghers roaring to and fro on business that cannot wait. It was wide enough for half a dozen to go and come at the same time, yet they used to jostle one another continually in this entrance, so great was the throng of workers and so vigorous the energy that burbled within them. While the warm sun of an August day shines a white-faced hornet is as full of pent forces, striving continually to

burst him, as a steam fire-engine is when the city is going up in flame and smoke and the fire chief is shouting orders through the megaphone and the engineer is jumping her for the honor of the department and the safety of the community. He burbles and bumps and buzzes and bursts, almost, in just the same way.

It is no wonder that people misunderstand such roaring energy, driving home sometimes too fine a point, and speak of *Vespa maculata* and his near of kin the yellow jackets, and even the polite and retiring common black wasp, with dislike. In this the genial Ettrick Shepherd, high priest of the good will of the open world, does him, I think, much wrong. "O' a' God's creatures the wasp," he says, "is the only one that is eternally out of temper. There's nae sic thing as pleasing him."

This opinion is so universal that there is little use in trying to controvert it, and yet these white-faced hornets which I have known, if not closely, at least on terms of neighborliness, do not seem to merit this opprobrium. That they are hasty I do not deny. They certainly brook no interference with their right to a home and the bringing up of the family. But I do not call that a sign of ill temper; I think it is patriotism.

Probably the trouble with most of us is that we have happened to come into quite literal contact with white-face after the fashion of one of the early explorers of the country about Massachusetts Bay. Obadiah Turner, the English explorer and journalist, thus chronicles the adventure in the quaint phraseology of the year 1629.

"Ye godlie and prudent captain of ye

occasion did, for a time, sit on ye stumpe in pleasante moode. Presentlie all were hurried together in great alarum to witness ye strange doing of ye goode olde man. Uttering a lustie screme he bounded from ye stumpe and they, coming upp, did descrie him jumping aboute in ye oddest manner. And he did lykwise puff and blow his mouthe and roll uppe his eyes in ye most distressful waye.

"All were greatlie moved and did loudlie beg of him to advertise them whereof he was afflicted in so sore a manner, and presentlie, he pointing to his foreheade, they did spy there a small red spot and swelling. Then did they begin to think yt what had happened to him was this, yt some pestigeous scorpion or flying devil had bitten him. Presentlie ye paine much abating he saide yt as he sat on ye stumpe he did spye upon ye

branch of a tree what to him seemed a large fruite, ye like of wch he had never before seen, being much in size and shape like ye heade of a man, and having a gray rinde, wch as he deemed, betokened ripenesse. There being so manie new and luscious fruites discovered in this fayer lande none coulde know ye whole of them. And, he said, his eyes did much rejoice at ye sight.

"Seizing a stone he hurled ye same thereat, thinking to bring yt to ye grounde. But not taking faire aime he onlie hit ye branch whereon hung ye fruit. Ye jarr was not enow to shake down ye same but there issued from yt, as from a nest, divers little winged scorpions, mch in size like ye large fenn flies on ye marshe landes of olde England. And one of them, bounding against hys forehead did give in an instant a most

terrible stinge, whereof came ye horrible paine and agonie of wch he cried out."

Let go on the even tenor of his home-building and home-keeping way, white-face is another creature. One of his kind used to make trips to and from my tent all one summer, and we got to be good neighbors. At first I viewed him with distrust and was inclined to do him harm, but he dodged my blow and without deigning to notice it landed plump on a house-fly that was rubbing his forelegs together in congratulatory manner on the tent roof. He had been mingling with germs of superior standing, without doubt, this housefly, but his happiness over the success of the event was of brief duration. There came from his wings just one tenuous screech of alarm followed by an ominous silence of as brief duration. Then came the deep roar

of the hornet's propellers as he rounded the curve through the tent door and gave her full-speed ahead on the home road. An hour later he was with me again, had captured another fly almost immediately, and was off. He came again, many times a day, and day after day, till I began to know him well and follow his flights with the interest of an old friend.

He never bothered me or anyone else. He had no time for men; the capture of house-flies was his vocation and it demanded all his energy and attention. In fact that he might succeed it was necessary that he should put his whole soul into earnest endeavor, for he was not particularly well equipped for his work. He had neither speed nor agility as compared with his quarry, and if house-flies can hear and know what is after them, the

roar of his machinery, even at slowest speed, must have given them ample warning. It was like a freighter seeking to capture torpedo boats. They could turn in a circle of a third the radius of his and could fly three miles to his one, yet he was never a minute in getting one.

I think they simply took him for an enlarged edition of their own kind and never knew the difference until his mandibles gripped them. He used to go bumbling and butting about the tent in a near-sighted excitement that was humorous to the onlooker. He did n't know a fly from a hole in the tentpole, and there was a tack in the ridgepole whose head he captured in exultation and let go in a sort of slow wonder every time he came in. He got to know me as part of the scenery and did n't mind lighting on top of my head in his quest, and he never thought of

stinging me. I timed his visits one sunny, still day and found that he arrived once in forty seconds. But this was only under most favorable weather conditions. A cloud over the sun delayed him and in wet weather he was never to be seen.

His method with the fly in hand was direct and effective. The first buzz was followed by the snip-snip of his shear-like maxillaries. You could hear the sound and immediately see the gauzy wings flutter slowly to the tent floor. If the fly kicked much his legs went in the same way. Then white-face took a firmer grip on his prize and was off with him to the nest. The bee line is spoken of as a model of mathematical directness, but the laden bee seeking the hive makes no straighter course than did my hornet to his nest in the berry bush down in the pasture.

Flies were plentiful and, knowing how many hornets there are in a nest, I expected at first that he would bring companions and perhaps overwhelm my hospitality with mere numbers, but he did nothing of the kind. I have an idea that he was detailed to the fly catching work just as other workers were busy gathering nectar and honey dew for the young and others still were nest and comb building. Later in the summer another did come, but I am convinced that he happened on the other's game preserve by accident and was not invited. The two between them must have captured thousands of flies and carried them off alive to their nest.

Thus their paper fort, hung from the twigs of a blueberry bush, had by September grown to the dimensions of a water-bucket and contained a prodigious

Their paper fort had by September grown to the dimensions of a water-bucket and contained a prodigious swarm of valiant fighters

swarm of valiant fighters and mighty laborers, so much will persistent labor, even by near-sighted, dunder-headed hornets, accomplish. I say near-sighted, for the two specimens of *Vespa maculata* who used to hunt flies in my tent were certainly that. I say also dunder-headed, for if not that they would have learned eventually the location of that tack head and ceased to capture it. Barring these failings, no doubt congenital, I know of no pasture people who show greater virtues or more of them than the white-faced hornets.

The weak beginnings of their great community home in the berry bush were made in early May when a single lean and hungry queen mother crept from a crevice in the heart of a great hollow chestnut where she had survived the winter. She sunned herself for a time at the opening,

then began eagerly chewing fibre from a gray and bare dead limb near by. She chewed this and when it was softened to a pulp she flew straight to the berry bush and began her long summer's work. Laboring patiently she made and brought enough of the paper pulp moistened with her own saliva to form a nest half the size of an egg containing just a few cells in a single comb that was horizontal and opened downward. In these she laid an egg each, worker's eggs.

Always the first brood is of workers only, and it would seem that the mother hornet is able by some strange necromancy to lay an egg which shall produce, as she wills, a worker, a drone or another queen, for the hornet hive, like that of the honey-bee, has the three varieties. While these eggs hatch she completes the nest and then begins feeding the funny

little white maggots which hang head down in the cells, stuck to the top by a sort of glue which was deposited with the egg.

Honey and pollen is the food which the youngsters receive, varied as they grow up with a meat hash of insects caught by the mother and chewed fine. Soon they fill the cells, stop eating, and spin for themselves a sort of silk night shirt and a cap with which they close the mouth of the cell. Here they remain quiet for a few days, changing from grub to winged creature as does a butterfly during the chrysalis stage of its existence.

Those were busy days for the queen mother, for she had the work and the care of the whole wee hive on her hands, and she showed herself capable not only of doing her own feminine part in the hive economy, but that of half a dozen work-

ers as well, making paper, doing construction work, finding and bringing honey and pollen and insects for the food of the young grubs, and finally helping them cut away the seals to the cells and grasping the young hornets in her mandibles and hauling them out of their comb.

These young hornets washed their faces, cleaned their antennæ, ate one more free meal and set to work. Thereafter the queen mother, having reared her retinue, worked no more, but kept the hive and produced worker eggs as new cells were provided for them, now and then perhaps feeding the children when the workers were busiest.

The first care of the new-born workers was to clean out the once used cells and to build new ones. But there was no room for new comb within the thin paper

envelope which the mother had built as a first hive. They therefore cut this away, chewing it to pulp again, and building new cells with a larger covering all about them. Then below the first comb they hung a second by paper columns so that there was space for them to pass between the two, standing on top of one comb while they fed the young hanging head down in the comb above.

They also added cells to the sides of the old comb, making it much wider. The first little round egg-shaped nest was all of one color, a soft gray, but the new additions are apt to be lighter or darker in color, according to the idiosyncrasies of the individual worker. Some indeed have a faint touch of brown when newly added to the structure though these soon fade, yet you may recognize always the dividing line between one hornet's

work and another's by the difference in shade.

Thus the work went on during the summer, more cells being added to the existing combs, new combs being hung below, and always the surrounding envelope being cut away and replaced to accommodate the internal growth. Late August saw the last additions made. The hive then roared with life. The summer had been a good one and food was plentiful. Under the bounty of fierce summer heat and ample food the workers had developed a new faculty.

I have given them the masculine pronoun in speaking of them, for they certainly seemed to deserve it. Surely only males could be at once so sharp and so blunt, so burly, so strenuous and so devoid of interest in anything but their work. Yet it is a fact that in August

some of the workers began to lay eggs, and if the old proverb that "Like produces like" holds good they still deserve the masculine pronoun, for these eggs produced only males.

At the same time the queen began to lay eggs which were destined to produce other queens. How all this could have been known about beforehand it is hard to tell, but such must have been the fact, for the cells in which these eggs were to be laid were made larger than the others as the greater size of males and females requires.

Thus the climax of the work of the great paper hive was reached. The new queens had been safely reared and had reached maturity when the first chill days of autumn came. These days brought rain, and the change from bustling life to silence was most startling. Almost in

a day the hive was deserted. It was as if the entire colony had swarmed, and so they had, but not as a hive of bees swarms. They had left the old home never to return, but not as a colony seeking a new land in which to prosper. The first chill of autumn laid the cold hand of death on their busy life. They went away as individuals and stopped, numbed with cold, wherever the chill caught them.

Where they went it is hard to say, but one hornet or a thousand crawling into a crevice to escape the cold is easily lost in the great world of out-of-doors. No worker survives the winter. I think the intensity of their labors during the summer, the continued use of that energy that bubbles within them all summer long, exhausts them and they succumb easily, worked out. With the young queens it is different. Their work is yet

to come, and the strong young life within them gives them vitality to endure the winter, though seemingly frozen stiff in their crevices. Yet only a few of these come through in safety. If the queens of one hive all built next year, the pasture would be a far too busy place for mere man to visit.

It is just as well as it is, yet I am glad that each year sees at least one queen white-face pulp-making in the May sun. Pasture life without her uproarious progeny would lack spice. The great gray nest is pathetic in its emptiness, and I am glad to forget it and its bustling throng, remembering only the one busy worker that used to come into the tent and, having caught his fly, hang head downward from ridge-pole or canvas-edge by one hind foot while all his other feet were busy holding his lamb for the shearing.

THIN ICE

THIN ICE

TOWARD midnight the pond fell asleep. All day long it had frolicked with the boisterous north wind, pretending to frown and turn black in the face when the cold shoulders of the gale bore down upon its surface, dimpling as the pressure left it and sparkling in brilliant glee as the low hung sun laughed across its ruffles. The wind went down with the sun, as north winds often do, and left a clear mirror stretching from shore to shore, and reflecting the cold yellow of the winter twilight.

As this chill twilight iced into the frozen purple of dusk, tremulous stars quivered into being out of the violet blackness of space. The nebular hypoth-

esis is born again in the heavens each still winter night. It must have slipped thence into the mind of Kant as he stood in the growing dusk of some German December watching the violet-gray frost vapors of the frozen sky condense into the liquid radiance of early starlight, then tremble again into the crystalline glints of unknown suns whirling in majestic array through the full night along the myriad miles of interstellar space.

Standing on the water's edge on such a night you realize that you are the very centre of a vast scintillating universe, for the stars shine with equal glory beneath your feet and above your head. The earth is forgotten. It has become transparent, and where before sunset gray sand lay beneath a half-inch of water at your toe-tips, you now gaze downward through infinite space to the nadir,

the unchartered, unfathomable distance checked off every thousand million miles or so by unnamed constellations that blur into a milky way beneath your feet. The pond is very deep on still winter nights.

If you will take canoe and glide out into the centre the illusion is complete. There is no more earth nor do the waters under the earth remain; you float in the void of space with the Pleiades for your nearest neighbor and the pole star your only surety. In such situations only can you feel the full loom of the universe. The molecular theory is there stated with yourself as the one molecule at the centre of incomputability. It is a relief to shatter all this with a stroke of the paddle, shivering all the lower half of your incomputable universe into a quivering chaos, and as the shore looms black and uncertain in the bitter chill it is never-

theless good to see, for it is the homely earth coming back to you. You have had your last canoe trip of the year, but it has carried you far.

No wonder that on such a night the pond, falling asleep for the long winter, dreams. A little after midnight it stirred uneasily in its sleep and a faint quiver ran across its surface. A laggard puff of the north wind that, straggling, had itself fallen asleep in the pine wood and waked again, was now hastening to catch up. The surface water had been below the freezing point for some time and with the slight wakening the dreams began to write themselves all along as if the little puff of wind were a pencil that drew the unformulated thoughts in ice crystals. Water lying absolutely still will often do this. Its temperature may go some degrees below the freezing point

and it will still be unchanged. Stir it faintly and the ice crystals grow across it at the touch.

Strange to tell, too, the pond's dreams at first were not of the vast universe that lay hollowed out beneath the sky and was repeated to the eye in its clear depths. Its dreams were of earth and warmth, of vaporous days and humid nights when never a frost chill touched its surface the long year through, and the record the little wind wrote in the ice crystals was of the growth of fern frond and palm and prehistoric plant life that grew in tropic luxuriance in the days when the pond was young.

These first bold, free-hand sketches touched crystal to crystal and joined, embossing a strange network of arabesques, plants drawn faithfully, animals of the coal age sketched in and suggested only,

while all among the figures great and small was the plaided level of open water. This solidified, dreamless, about and under the decorations, and the pond was frozen in from shore to shore. Thus I found it the next morning, level and black under one of those sunrises which seem to shatter the great crystal of the still atmosphere into prisms. The cold has been frozen out of the sky, and in its place remains some strange vivific principle which is like an essence of immortality.

New ice thus formed has a wonderful strength in proportion to its thickness. It is by no means smooth, however. The embossing of the reproductions of these pond dreams of fern and palm and plesiosaurus makes hubbles under your steel as you glide over it, though little you care for that on your first skate of the

year. The embossing it is, I think, that largely gives it its strength, and though it may crack and sag beneath you as you strike out, you know that its black texture is made up of interlacing crystals that slip by one another in the bending, but take a new grip and hold until your weight fairly tears them apart.

The small boy knows this instinctively and applies it as he successfully runs "teetley-bendoes" to the amazement and terror of the uninitiated grown-ups. If you have the heart of the small boy still, though with an added hundred pounds in weight, you may yet dare as he does and add to the exhilaration born of the wine-sweet air the spice of audacity. An inch or so of transparent ice lies between you and a ducking among the fishes which dart through the clear depths, fleeing before the under water roar of your ad-

vance, for the cracks, starting beneath your feet and flashing in rainbow progress before you and to the right and left, send wild vibrations whooping and whanging through the ice all over the pond. Now the visible bottom drops away beneath you to an opaqueness that gives you a delicious little sudden gasp of fear, for you realize the depth into which you might sink; again it rises to meet you and here you may bear down and gain added impetus, for you know that the ice will be thicker in shallow water.

So you go on, and ever on. It is not wise to retrace your strokes, for those ice crystals that gave to let you through and then gripped one another again to hold you up may not withstand a second impact; nor is it wise to stop. Mass and motion have given you momentum and

you have acquired some of the obscure stability of the gyroscope. You tend to stay on your plane of motion, though the ice itself has strength to hold only part of your weight. Thus the wild duck, threshing the air with mighty strokes, glides over it, held up by the same obscure force. The ice has no time to break and let you through. You are over it and onto another bit of uncracked surface before it can let go.

The day warmed a little with a clear sun but the frost that night bit deep again and the next morning the ice had nearly doubled in thickness and would not crack under any strain which my weight could put upon it. A second freezing, even though both be thin, gives a stronger ice than a single freezing of equal depth, just as the English bow-maker of the old days used to glue to-

gether a strip of lancewood and a strip of yew, or even two strips of the same wood, thus making a far stiffer bow than one made of a single piece of equivalent dimensions.

This ice was much smoother too. That evaporation which is steadily going on from the surface of ice even in the coldest weather, the crystals passing to vapor without the intervening stage of water, had worn off the embossing. The ice instead of being black was gray with countless air bubbles all through its texture. You will always find these after a day's clear sun on a first freezing. I fancy the ice crystals make minute burning glasses under the sun's rays and thus cause tiny meltings within its own bulk, the steam of the fusing making the bubbles; or it may be that the air with which the north wind of two days before

had been saturating the water was thus escaping from solution.

It was midday of this second day of skating weather before I reached the pond. The sky was overcast, the wind piped shrill again, and there were snow-squalls about. The pond was empty and lone. I thought no living creature there beside myself, and it was only at the second call of a familiar voice that I believed I heard it. Then, indeed, I stopped and listened up the wind. It came again, a wild and lonely whistle that was half a shout, beginning on the fifth of the scale, sliding to the top of the octave, and then to a third above, and I heard it with amazement. The pond was firmly covered with young ice. Why should a loon be sitting out on it and hooting to me?

There was silence for a space while I

looked in vain, for the first flakes of a snow-squall were whitening the air and had made the distant shore indistinct. Then it spoke again, almost confidentially, that still lonely but more pleasing whinny, a sort of "Who-who-who-who" that is like a tremulous question, weird laughter, or a note of pain as best fits the mind of the listener. The voice came from the geographical centre of the pond's loneliness, the one point where a wild bird like the loon, obliged to make a stand, would find himself farthest from all frequented shores. I skated up the wind in that direction, but the snow blew in my eyes and I could see but little.

Suddenly right in front of me there was a wild yell of dismay, despair and defiance all mingled in a single loon note, but so clearly expressed that you could not fail to recognize them, then a quick

splash, and I had almost skated into a hole in the ice, perhaps some ten feet across.

Then I knew what had happened. A loon, wing-tipped by some poor marksman, had dropped into the pond before the freeze. He could dive and swim, no doubt, as well as ever but could not leave the water. When the pond began to freeze he did the only thing possible in his losing fight. That was to seek the loneliest spot in the surface and keep an opening in the ice when it began to form. I could see the fifteen-foot circle which had been his haven for the first night and day. Then with the second freezing night he had been obliged to shorten this. Two feet and a half of new ice showed his inner line of defence rimmed accurately within the greater circle and showing much splashing where he had, I

thought, breasted it desperately all the long night in his brave fight to keep it open.

How long without human intervention he might brave the elements and keep his narrowing circle unfrozen would of course depend on the weather. If it did not come on too severe he might live on there till his wing healed and by a miracle win again to flight and safety. The cold would not trouble him nor the icy water. The loon winters anywhere from southern Massachusetts south and, strong and well, has no fear of winter. But there entered into this the human equation. The next man along would likely go home and get a shotgun.

As I noted all this a head appeared above the water in the pool. There was another shriek of alarm and it vanished in a flash and a splash. It was forty sec-

onds by my watch before the bird appeared again. This time he rose almost fully to the surface and sounded a war cry, then dove again and was under for seventy seconds. And so as long as I stood my distance motionless he came and went, never above water for more than a few seconds, varying in length of time that he stayed below from half a minute to a minute and a quarter, and never going below without sounding the eerie heartbreak of his call.

Then I skated away to get my camera and was gone three-quarters of an hour. Returning I saw him in the distance, for the snow had almost passed. He saw me too and dived. Gliding up I knelt at the very edge of the hole and was fixing the camera when he came up. He sat level on the surface for a second, seemingly not noticing me. Then, warned by

a motion that I made in trying to adjust the focus, he sounded a wild and plaintive call that seemed to have in it mingled fear and defiance, heartbreak and triumph, and plunged beneath the surface with a vigor and decision that sent him far beneath the ice, his great webbed feet driving him with great jumps, as a frog swims.

I saw him shoot away from the hole, trailing bubbles. I waited kneeling, watch in hand and thumb on bulb, a minute, two minutes, three, five, ten. The snow shut in again thick, the north wind sang a plaintive dirge and I realized that the picture would never be taken. Instead I was kneeling at the deathbed of a wild Northern spirit that perhaps deliberately took that way of ending the unequal struggle.

The loon knows not the land. Even

his nest he builds on the water's edge and clambers awkwardly to it with wings and bill as well as feet. The air and water are his home, the water far more than the air, and he knows the underwater world as well as he does the surface. I shall never know whether my loon went so far in his flight beneath the ice that he failed to find his way back, or whether his strength gave out. Knowing his untamed and fearless spirit I am inclined to believe that he deliberately elected to die at home, in the cool depths that he loved rather than come back to his poor refuge in the narrowing ice circle and face that strange creature that knelt at the edge.

WINTER FERN-HUNTING

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THE spring of this, our new year of 1909, is set by the wise makers of calendars to begin at the vernal equinox, say the twenty-first of March, but the weatherwise know that on that date eastern Massachusetts is still in the thrall of winter, and spring, as they see it, is not due till a month later.

Yet they are both wrong, and we need but go into the woods now to prove it. The spring in fact is already here. The new life in which it is to express itself in a thousand forms is already growing and much of it had its beginning in late August or early September of last year. The wind out of the north may retard it indeed, but it needs but a touch of the

south wind to start it in motion again, and the deep snows that are yet to come and bury it so that the waves of arctic atmosphere that may roll over its head for weeks will never be able to touch it are a help.

Many a hardy little spring plant blooms first, not in April as we are apt to think, but more likely in January, though it may be two feet deep beneath the snow and ice and unseen by any living creature. To go no farther than my own garden, I have known a late January thaw, rapidly carrying off deep snow, to reveal the "ladies' delights" in bloom beneath an overarching crust of ice. The warm snow blankets had effectually insulated the autumn grown buds from the zero temperature two feet above, and the warmth of the earth beneath had not only passed through the frost but melted

a little cavern beneath the snow, and there the hardy plants had responded to the impulse of the spring that was already with them.

In this wise the chickweed blooms the year round though rarely are circumstances such that we note it in the winter months. Now and then the hepatica opens shy blue eyes beneath the enfolding snow and it is common in times of open weather in midwinter to read newspaper reports of the blooming of dandelions in December, or January. These are just as much in bloom on other winters but the snow covers them from sight and it takes a thaw which sweeps the ground clear of snow to reveal them.

It is good now and then to get a green Christmas such as we have just had, for in it we may go forth into the fields and realize that the spring has not retreated

to the Bahamas, but merely to the subsoil, whence it slips, full of warmth and thrill, on any sunshiny day. If we will but seek the right places we need not search long to find April all about us, though they may be cutting ten-inch ice on the pond and winter overcoats be the prevailing wear.

To-day I found young and thrifty plants, green and succulent, of two varieties of fern that are not common in my neighborhood and that I had never suspected in that location. I had passed them amid the universal green of summer without noticing them, but now their color stood out among the prevailing browns and grays as vividly as yellow blossoms do in a June meadow.

Yet I sought the greater ferns of my acquaintance in vain in many an accustomed place. Down by the fountain

head is a spot where the black muck, cushioned with yielding sphagnum, slopes gently upward to firmer ground beneath the maples till these give way to the birches on the drier hillside. Here the ostrich fern waved its seven-foot fronds in feathery beauty amid the musky twilight of the swamp all summer long.

It was as if giants, playing battledore, had driven a hundred green shuttlecocks to land in the woodcock-haunted shelter. The tangle of their fronds was chin high and you smashed your way through their woody stipes with difficulty, so strong and thick were they. Now they have vanished and scarcely a trace of their presence remains. Brown and brittle stalks rise a little from the earth here and there, and if you search among fallen leaves you may find the ends of their root-stalks with the growth for next year

coiled in compact bundles there, ready to unfold.

From these rootstalks spring in all directions slender underground runners whence will grow new plants. But none of this is visible. The only reminder of that once luxurious thicket is the brittle, brown stalks that still, here and there, protrude from the fallen leaves.

It is difficult to see where they all went, but there is something savoring of the supernatural about ferns, anyway. Shakspeare says: "We have the receipt of fern-seed; we walk invisible." For men to use this receipt the seed must be garnered on St. John's eve in a white napkin with such and such incantations properly recited. The *Struthiopteris germanica* had plenty of fern-seed on St. John's eve. It must have used the old-time incantations with success, for all the

giant shuttlecocks that thronged the swale with a close-set tangle of feathery green have vanished.

I sought another moist and shady woodland where all the early spring the ground was a warm pinky brown with the fuzz of uncurling fiddle heads, and later the brown, leaf-carpeted earth was hidden in a delicate lace patterned of the young fronds of the cinnamon and the interrupted fern. To this woodland came the yellow-warblers for the soft fuzz for use in nest building, it compacting readily into a felt-like mass that is at once yielding and durable. The cinnamon fern when it has reached any size has an underground stump that is as woody and tough almost as that of a tree. Its strong fronds are next to those of the ostrich-fern in the woody vigor of their stipes. Surely these might have lasted.

Yet not one form of fern life was visible in this once thronged wood. Like the ostrich ferns they had poured their own fern-seed on their heads and whispered the correct incantation at the coming of the first chill wind. I am inclined to think it all happened in a jiffy, when happen it did, for I have been back and forth through that part of the wood all the fall and I cannot recall the day on which they were first missing. It seems as if I would have noticed their gradual crumbling and decay.

The same is true of the clumps of *Osmunda regalis* that grew here and there along the pond shore. Rightly named "regalis" they stood in royal beauty four or five feet tall and leaning over the water's edge admired the bipinnate grace of their fronds, while the tallest stalks bore aloft the clusters of spore cases that

looked like long spikes of plumed flowers. No wonder the plant which is common to England also drew the notice of Wordsworth, who refers to it as —

> " that tall fern,
> So stately, of the queen Osmunda named.
> Plant lovelier in its own retired abode
> On Grassmere beach than naiad by the side
> Of Grecian brook."

Flowering fern it is rightly named, too, but it had flowered and gone, and I found of all its regal beauty but a single stalk with brown spore-cases held rigidly aloft among a tangle of brown leaves and bog grass.

Then I looked for the sensitive fern. This with its slender, creeping rootstock sending up single fronds is less woody than any of the others and I began to suspect that it would have disappeared utterly. So the sterile fronds had.

There was no trace of them in spots that in summer were a perfect tangle. But this was not true of the fertile stalks. Here and there these, like the one of the royal fern, stood erect and bore their close-lipped spore cases, seal-brown and stiff, high above dead leaves and other decay of fragile annuals.

All this made a disheartening fern chase, and I turned to the steep side of the hemlock-shaded northern hill, sure of one hardy variety that would have no use for invisibility, however chill the north wind might blow. No smile of direct sunlight ever touches this hill. It is set so steep that only the mid-summer midday sun overtops its slant and this the dense hemlock foliage shuts out. No woodland grasses grow in its dense shadow and only here and there the partridge berry and the pyrola creep down a little from

the top of the ridge where some sunlight slips in. Yet in its densest part the Christmas fern revels and throws up fronds that seem to catch some of their dark beauty from the deep green twilight of the place. In the spring these stand in varying degrees of erectness, but autumn seems to bring a change in the cellular structure of the lower part of the stipe and weaken it so that the fronds fall flat upon the earth. They lose none of their firm texture or color, however, and be the temperature ever so low or the snow ever so deep they undergo no further change till the next spring fronds are well under way. Sometimes even in mid-summer you may find the fronds of the year before, somewhat fungi-encumbered and darkened with age, but still green.

No other fern grows in the denser

portions of this hemlock twilight, though the Christmas fern clings close to it, and does not spread to the more open glades on other portions of the hill. Another northern hill of similar steepness but shaded by an old growth of pines through which certain sunlight filters during most of the day has specimens of the *Polystichum acrostichoides* growing only in its most sheltered nooks from which they do not seem to spread even to the brighter spots near by on the same declivity. Hence I infer that the plant prefers the twilight, and does not thrive in even occasional sunlight.

Just at the base of this second hill, however, where cool springs begin to bubble forth in the mottled shadow, I caught a gleam of a lighter, lovelier green that was like a dapple of sunlight on clumps of Christmas ferns, and I came

near passing it by for that. Then, because I had never seen this fern growing in a dapple of sunlight, I went to it and found that I had chanced upon a group of the spinulose wood fern. The plumose fronds showed no more winter effects than did those of the Christmas ferns. The keen frosts had not shrivelled them, nor was there any hint of the brown that might come with the ripening of leaves or the departure of sap.

Like the other ferns they had suffered a failing of tissues near the base of the stipe, but pinnules, midribs and rachis were as softly, radiantly green as they had been under the full warmth of the summer sun. Owing to this failure of tissues in the stipe they lay flat to the ground, but they were still beautiful, perhaps more so than they had been when they stood more erect in summer, and

were obscured and hidden by the other green things of the wood. I know I tramped within a few feet of them again and again last summer without noticing them, yet to-day they caught my eye a long way off, and held it in admiration even after a long and close inspection.

Farther down in the very swamp, laid flat along the sphagnum and oftentimes frozen to it, were fronds of the crested shield-fern and the patches of these tolled me far from my find and it was only on coming back for another look that I discovered the prettiest thing about it. That was, near by and half sheltered by tips of the elder fronds, young plants of the same variety, just advancing from the prothallus stage and having one or two miniature fronds like those of the parent plant but not more than two or three inches long.

These looked so tiny as compared with the mature ferns, but were so erect and confident, so fresh and green and very much alive though the temperature about them night after night had been far below freezing and their roots then stood in ice, that it was worth a journey, just to look at them. How their tender tissues had stood the temperature of ten above zero that had surrounded them a few nights before is more than I can answer. The faintest touch of frost kills the fronds of the great seemingly tough cinnamon and ostrich ferns. Yet these dainty little plants of *Nephrodium spinulosum* with their miniature fronds of tender lacework had not even wilted or cowered before deep and continued cold as had the stalks of their elders of the same species, but stood erect, nonchalant and seemingly eagerly growing still.

We may say if we will that it is all a part of that magic of youth that makes a million miracles each spring but that does not explain it. Why should these be so strong and full of life when the fronds of the hay-scented fern, for instance, have been shrivelled to dry and crumbling brown fragments under the same conditions? I cannot answer this either.

Last of all I thought of the polypodys that grow in the rock crevices all down along the glen, and went to see how they fared. It has been a hard year for these little fellows. There must have been weeks at a time during the scorching days of the long summer's drought that their roots, clinging precariously in rock crevices and dependent for moisture wholly on rain and dew, were dry to the tips. The very heat of the rock itself

under the blister of the sun would not only evaporate all moisture, but would so remain in the rock all night as to prevent any dew from condensing on it.

I had seen the polypodys at midday curled up on themselves seemingly nothing but dried tissues that could never be again infused with the breath of green life. Yet, let there come but the briefest of showers and you would see them uncurl, lift their fronds to the breeze, and go on as cheerily as their lower level neighbors the lady-ferns whose pinnules flashed in the drip of the splashing stream and whose roots bathed in the shallows.

The summer must have weakened them. Were they the sort to shrivel at the touch of the freezing wind and vanish into the fern-seed magic of invisibility? Not they. The slender crevice of black dirt in which their roots grow was black

adamant with frost, but the polypodys swayed in the biting wind as jauntily as they had in the soft airs of summer and were as green and unharmed by the winter thus far as the Christmas ferns had been.

While I gazed at them, admiring their toughness and courage, my eye caught a bit of greenery on the rock high above and I had found the second unexpected fern of my winter day's hunt, for there from a crevice dripped the rounded, finely crenate, dark green pinnæ of *Asplenium trichomanes*, the maidenhair spleenwort.

Many a day during the summer had I sat on that ledge, listening to the prattle of the brook down the glen and watching the demoiselle flies flit coquettishly up and down stream while the dragonflies with masculine directness darted hither

and thither. The polypodys must have often dropped their fern-seed on my head, but the magic that they invoked with it must have been of the sort that made not me, but the little fern above invisible, for it remained for this winter day of a green Christmas week to show me its fragile beauty still green and undisturbed in the winter weather. No other evidence was needed, nor could I have any so good, to prove that spring is indeed here before the winter comes, and though the cold and snow may retard they cannot prevent it from reaching the full beauty and climax of maturity.

THE BARE HILLS IN MIDWINTER

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TOWARD morning the south rain, whose downpour was the climax of the January thaw, ceased, and in the warm silence that followed Great Blue Hill seemed like a gigantic puffball growing out of the moist twilight into the dryer upper atmosphere of dawn. Standing on its rounded dome you had a singular sense of being swung with it upward and eastward to meet the light. At such times the whirling of the earth on its axis is so very real that one wonders that the ancients did not discover it long before they did. Surely their mountaineers must have known.

After a little the battlemented donjon

of the observatory looms clear and you begin to notice other details of the gray earth beneath your feet. The south wind has brought and left with you for a brief space the atmosphere of the Bermudas, and you need only the joyous hubbub of bird songs to think it June instead of January. Instead there is a breathless silence that is like resignation and a portent all in one. Breathing this soft air in the golden glow of daybreak it seems as if there could never be such things as zero temperature and northwest gales; but the whole top of the hill keeps silence. It knows.

As the day grows brighter you can see the little scrub-oaks that make the summit plateau their home crouch and settle themselves together for the endurance test which is their winter lot. They have opened their hearts to the south rain

while it lasted, but they know what to expect the moment it is gone. They studied the weather from Blue Hill summit long before the observatory was thought of.

All trees love the hill, but few can endure its winter rigors. You can see where the hickories and red cedars have swarmed up the steep from all sides, and as you note how the scrub-oaks compact themselves you will see also the cedars holding the rim of rock as did that thin red line of Scottish Highlanders at Inkermann, all dwarfed and crippled with the struggle till they seem far different trees from the debonair slim and sprightly red cedars of the alluvial plain. You can fairly see them clench their teeth and hang on.

Yet they love the rocks that they have gripped for some hundreds of years, and

nothing but death will part them. There are red cedars growing out of the gray granite near the southern rim of Blue Hill that I believe were there when Bartholomew Gosnold stepped ashore, the first Englishman to set foot on the soil of Massachusetts. No such age belongs to the hickories that have managed to get head and shoulders above the rim of the plateau, yet they too have lost their slender straightness. The cold and the summit winds have pressed them back upon themselves till they are stubby, big-headed dwarfs.

Of how the other trees climb the hill we shall learn more if we begin at the bottom, and we could have no better day in which to look them up than this, for the south rain has swept the ground bare of all snow and left us for a space this temperature of the Carolinas rather than

that of Labrador, which is our usual portion in January. Indeed, from the sunny plain which stretches from the southern base of the rock declivity you can see where even tender and jocund plants once began the climb most jauntily.

Stalwart yellow gerardias, six feet tall some of them, grow in the rich black mould that makes steps upward through the rock jumble. From August till the frost caught them they scattered sunshine all along beneath the hickories and chestnuts, maples and white oaks, tipping it out of golden bowls to be shattered into the mists of goldenrod blooms that followed after. These gerardias, though dry and dead, stand now, and will stand despite gales and snow all winter long, boldly lifting brown seed pods aloft, pods that grin in the teeth of bitter gales and send their chaffy seeds floating up the

slope to plant the sunshine banner a little farther aloft for next year. Many centuries they have been at it, but few of them have climbed far, yet they so love the hill that they cling tenaciously to the ground they have gained and seem to grow more vigorously there than on less rugged soil.

The roughest ledges of the hill jut boldly to the southward, showing gray granite shoulders to the sun and making this side almost a sheer rock precipice. Yet here the Highlander cedars have chosen to make their climb in battalions, plaiding the gray surface with russet brown and olive green, clinging tenaciously by toe-tips where it would seem as if only air-plants might find nourishment. No other trees dare the bare granite steep, though hickories flank the cedars wherever the slopes of the ridge

have crumbled a little and given a better foothold of black soil.

Strange to say, the purple wood-grass that surely loves sandy plains best has sent little scouting parties up with the hickories, and here and there occupies tiny plateaus among the ledges well up toward the ridge, often rimmed round with the purplish green of the mountain cranberry. At the bottom of the gullies the maples began the climb, but they did not last long. Red and white oaks have won farther up, but stopped invariably before the summit of the gully was reached.

From the beautiful Eliot Memorial Bridge, near the eastern limits of the summit plateau of Blue Hill, you catch a wonderful glimpse southeasterly right down a narrow ravine to a wider valley, and thence down again to a glow of white

ice which is Houghton's Pond. The bare trees no longer hide one another and you see where they made a flank movement in force for the summit, swarming over the wider upland valley, and narrowing to a wild charge of great chestnuts up the gully. These chestnuts do not seem to stand rooted. They sway this way and that and seem to hurrah and wave flags in the wild excitement of a desperate and hopeful venture. They are motionless, of course, but they have all the semblance of splendid action that genius has given to sculpture, and they add romance to the most picturesque spot on the range. Yet never a chestnut top is lifted above the ridge which tops the gully. To it they came in all the fine enthusiasm of a well-planned and concerted advance, but stopped so suddenly that you see them in splendid action still, as if with one foot

in the air for the step that should take them above the ridge.

The north wind of the ages has stopped them right there where their tops are just far enough above the level of the ridge edge to be safe from it. You see them best by climbing down the little gully among evergreen wood ferns which grow in the rich, moist soil among the rocks, the only touches of green unless you happen upon some polypodys seemingly growing out of the rock itself.

Right among the chestnuts the semblance changes again with the harlequin-like magic of the woods. The big trees are no longer fixed in the attitude of desperate charge upon a rampart, as you saw them from above. Among them they seem to be tipsy bacchanals who have chosen the little secluded glen for a place of revelry, and are reeling about it like clumsy

woodsmen in a big-footed dance. A chestnut tree standing by itself on a plain is as stately and dignified as a village patriarch. Grouped together in level, rich woodland, chestnuts are prim and almost lady-like. Why these particular trees in the little glen at the east side of Blue Hill summit should skip about in clumsy riot is more than I can tell, but they certainly seem to do it, and I am not the only one who has seen it and been shocked by it.

Right near by is a company of school-girl beeches, very straight and slim and fair-skinned and pale. These have drawn together in a shivering group and show every symptom of feminine dignity, very young and quite outraged. They whisper and draw themselves up to the full tenuity of their height and you can hear the dry snip of indignation in their voices long

before you reach them. No doubt they thought to have the glen all to themselves for a proper picnic with prunes and pickles, and here are these great fellows thus misbehaving! It is a shame and the park police should put a stop to it. The beeches are so frosty in their indignant withdrawal that the icy whispering of their dry leaves sounds like fast falling sleet. Slip among them when you are next on the hill, shut your eyes and listen. The day may be as sunny and warm as a winter day can be, but you will think you hear the snow falling fast and will be sorry you have not brought your fur muffler.

As for the chestnuts, I suspect they drank mountain dew at the illicit still just below the gully. Surely no springs should have a license to do business among the hilltops of this granite range.

Yet they well up freely among the lesser spurs that lie between Great Blue and Hancock, and their moisture, drawn from cool depths to little ponds where the southern sun shines in and the north and west winds are held back by granite ridges, make rallying places for all kinds of wood and pasture people that have yearned for mountain heights, but could not stand the rigors of the summits. There are three of these little ponds on the heights of the range almost within a stone's throw of one another. It may be that the seepage from surrounding ledges accounts for their flow of water, but I am more inclined to think that cracks in the backbone of the hills let the water flow up from subterranean depths. The margins of two of them are the happy home of greenbrier which grows in tropical luxuriance all about, so binding the

bushes together with its spiny twine that it is almost impossible to pass through them to the water. Button-ball and high-bush blueberry grow with it and hold out their branches for its smilax-like decoration, and the solemn and secretive witch-hazel stalks meditatively about wherever the overhead foliage is dense enough to make the mysterious twilight that it best loves. It strolls up the gully beneath the shade of the chestnuts and you can but fancy it smiling sardonically at their revelry and the prim indignation of the schoolgirl beeches. Here and there swamp maples, strangely out of place on hilltops, glow gray in the dusk as you stand below them, or blush red in the clear sun as you look at their branch tips from the cliffs. It is a picturesque little three-spurred peak lying here between Great Blue and Hancock so shel-

tered and warm in the midday sun that it is only by watching the sky that you know it is winter, though the ice is white and strong on the little ponds.

I think you can get the best view of all of Great Blue Hill from the summit of the lesser hill beyond the spurs and ponds and south of Hancock, just overhanging Houghton's Pond. There you see the forest-clad slope sweep grandly up to form this broad upland valley, wrinkle a bit with the folds where lie the three little ponds, then rise again most majestically all along the steep side of the hill. At this time of year it is one broad, majestic mass of the warm gray of bare tree trunks in which rock ridges stand indistinct in purer color, while here and there clustering twig masses purple it. You can see the black shadows in the face of the cliff where stands the little glen in

which the chestnuts disport, and down near the highest of the three ponds is a beautiful little splash of white all flushed with pink. This marks the location of a group of young birches, the only ones I find on the heights of the range.

Midday had passed and with it the genial warmth that the south wind had brought us. Instead romping northern breezes had a tang in them and torn clouds sailed swiftly into view over the summit of Great Blue, rushing deep blue shadows across the warm grays of the landscape. The age-old battle of sun and wind was going on on every summit of the range. Climbing the southerly slope of Hancock it was hard to believe it winter. You got either season on the summit plateau according to the nook you chose, but standing on the rim of the precipice, which faces north you had no doubts.

From your feet to the foot of the hill in this direction it was winter indeed. Yet here was the greenest spot in the whole range. Scrambling perilously down the face of the cliff I touched rich green vegetation with either hand and stood amid luxuriance at the bottom. For here you are at the meeting place of ferns.

Little sunshine reaches the face of this cliff in the high noon of a midsummer day. No direct ray touches it all winter long, yet in the chill twilight the polypodys swarm all along the summit of the ridge and drip and dance down and stretch out their hands to neighbor ferns that climb cheerily to meet them out of the moist shadows below. These are the evergreen wood ferns. In the rich black frozen earth of the lower woodland they grow in profusion. On the rocky acclivity they hold each coign of vantage and

splash the plaid of gray rock and brown leaves with their rich green. Where cliff meets rock jumble the two draw together and fraternize, and the polypodys come farther off the cliff than I have often seen them, and the wood ferns grow in slenderer crevices of the bare rock than anywhere else that I know.

The sun was gone from all the little ravines on the way back from Hancock to Great Blue, and the chill of the fern-festooned shadow of the cliff that I had just left seemed to go with me all along. It was especially dark and chill in the little gully and I reached the summit of the big hill too late to find the sun. There, where daybreak had breathed of spring, nightfall shivered in the bite of winter winds. A million electric glints splintered the purple dusk to northward, but there was no warmth in them even

when they fused into the glow of the great city. With the shadow of night the cruel grip of winter had shut down on the hilltop and I knew again, as I had known in the golden glow of the morning, that it was midwinter. The dwarfed and storm-toughened shrubs seemed to crouch a little closer to the adamantine earth, and their frost-stiffened twigs sang in the bitter north wind. I felt the chill in my own marrow and eagerly tramped the ringing granite toward home.

SOME JANUARY BIRDS

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IT seems to be our lot this winter to have April continually smiling up in the face of January. Again and again the north wind has come down upon us and set his adamantine face against all such folly. The turf has become flint; the ice has been eight inches thick on pond and placid stream, and the very next morning, maybe, the soft air has breathed of spring, and bluebirds have twittered deprecatingly as if glad to be here, but altogether ashamed to be found so out of season. As a matter of fact, of course, some bluebirds winter with us, but they don't warble "cheerily O" in the teeth of the north winds. On those days you must seek them in the cuddly seclusion

of dense evergreens, more than likely among close-set cedars where the blue cedar-berries are still sweet and plenty. But we have had many days in this January of 1909 when the bluebirds have had a right to feel called to at least take a hurried glimpse at the bird boxes or the holes in the old apple trees, just as people take a flying trip to the summer cottage on a warm Sunday; they know they can't stay, but it is delightful to just look it over and plan.

I think the crows, though they are tough old winter residents, have something of the same impulse to plan nests and make eyes and cooing conversation, one to another. To-day I heard, in the pine treetops of a little pasture wood where several pair nest every year, the unmistakable note. In that great song of Solomon which the whole outdoor

world will chorus in the full tide of spring the crows have the bass part, no doubt, but they sing it none the less musically. It is surprising what a croak can become, between lovers.

I saw them slip away silently and shamefacedly as I approached, and I knew them for callow youngsters, high-school age, let us say, to whom shy love-making is never quite out of season. But they got their come-uppance the moment they sailed out of the grove, for their appearance was greeted with a wild and raucous chorus of crow ha-ha-ha's. High in the air, flapping round and round in silence above the pines, a half dozen riotous youngsters of their own age had been observing them, chuckling no doubt and winking to one another, and now that the culprits were driven out into the open where all could see

them the chorus of jeers knew no bounds. It was as unmistakable as the caressing tone, this jeering laughter. You had but to hear it to know very well what they were saying. The crow language has but one word, which in type is caw. But their inflections and tone qualities are such that it is easy to make it express the whole diatonic scale of primitive emotion.

Many of our summer birds whose winter range barely includes us seem to be more than usually prevalent this winter. It may be that the mild season has to do with this, but it is equally probable that a plenitude of food is more directly responsible. Seed-eating birds are particularly in luck this year. I do not know of a winter when the birch trees have fruited so plentifully, nor have I noticed so many flocks of song sparrows

as this year. I find them twittering happily along through the wood, hanging in quite unsparrow-like attitudes from slender birch twigs, busy robbing the pendant cones of their tiny seeds. In the summer you know the song sparrow as a very erect bird. He sits on some topmost twig of cedar or berry bush and pours forth quite the cheeriest and sweetest home song of the pasture land. Or perchance he flies, and the usual short and oft-repeated refrain seems to be broken up by flutter of his wings into a longer, softer, and more varied song that has less of challenge and more of sweet content in it. In his winter notes, which are really nothing but a cheery twittering, I always think I hear something of the mellow singing quality of this song of the wing.

To-day I saw a sharp-shinned hawk,

hunting noiselessly, no doubt for these same sparrows. He flitted among the treetops like a nervous flash of slaty gray, and was gone so quickly that had I not heard the welt of his wing tips on the resisting air as he turned a sharp corner I should never have seen him. Most of our hawks, though well known to take an occasional chicken, are mouse and grasshopper eaters. The sharp-shinned is the real chicken hawk, for he eats more birds than anything else, though the small songsters of the thicket form the greater part of his diet. I have rarely seen him here in winter, though his summer nest is common in the deep woods, with its cream-buff eggs heavily blotched with chocolate brown. Just as the plenitude of food of their kind kept the song sparrows with us to enjoy the mild weather, so I think the multitude

of song sparrows and other succulent tit-bits made the sharp-shinned hawk willing to winter where he had summered.

All these birds which are wintering as far north as they dare seem to come out and cheer up in the April-like days, but in those which are distinctly January you may tramp the woods for days and not see one of them. The flicker is a rather common bird with us the winter through. In a warm January rain you will often surprise him wandering about in the thawed fields, looking for iced crickets and half concealed grubs and chrysalids among the stubble. Let the snow come deep and the wind blow out of the north and the flicker vanishes from the landscape. It is as if he had gone into a hole and pulled his thirty-six nicknames in after him, so completely has the flicker disappeared. He is a strong-

winged bird and I have always been willing to think that at such times he simply whirled aloft on the northerly gale and never lighted till he was a few hundred miles to the south. He could do it easily enough. He would find bare ground and good feeding in the tidewater country of Virginia when New England is three feet under snow and the zero gales are drifting it deeper and freezing the heart out of the very trees in the wood.

The other day, though, I caught one of them sitting in the hollow of an ancient apple tree. There was an opening of some size facing the south into which the midday sun shone with refreshing warmth. Here, sheltered from the bite of the north wind the flicker had tucked himself away and was enjoying his sunny nook much as pigeons do in just the right angle of the city cornices. But he

was better off than the pigeons for there were fat grubs in the decaying wood that formed his shelter and he could use his meal ticket without leaving his lodgings. Our woods are full of such hostelries and they shelter more of the woodland creatures than we know as we tramp carelessly by.

But if the bluebirds and flickers hide themselves securely through the coldest winter days and the song sparrows and even the crows are apt to be scarce and subdued, as is certainly the case in my woods, there are other feathered folk who seem to delight in the cold and be never so gay as when the sky is leaden, the wind bites, and the frost flakes of snow squalls let the sun struggle through the upper atmosphere because it is too bitter cold to really snow. Of these the chickadees lead. They seem to be never

so merry as when they hear the sweet music of the tinkle of cold-tense snow crystals on the bare twigs.

In spite of the soft raiment in which the weather garbs itself to-day it is only three days ago that the great organ of the woods piped to the northerly wind as it breathed pedal notes through the pines and piped shrill in the chestnut twigs. And there was more than organ music. The white and red oaks, still holding fast to their brown leaves, gave forth the rattling of a million delicate castanets, and the wind drew like a soft bow across the finer strings of the birches so that all among slender twigs you heard this fine tone of a muted violin singing a little tender song of joy. For the trees were sadly weary of being frozen one day and thawed the next. They thought the real winter was at hand when the cold would

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be continuous and the snow deep. All we northern-bred folk love the real winter and feel defrauded of our birthright if we do not get it.

Strangest of all were the beeches. They have held the lower of their tan-pale leaves and with them have whispered of snow all winter long. Whatever the day, you had but to stand among them with closed eyes and you could hear the beech word for snow going tick, tick, tick, all about. It seemed as if flakes must be falling and hitting the leaves so plainly they spoke it. Now that the flakes were beginning the beeches never said a word, but just stood mute and watched it come and listened to the music of all the other trees. Or perhaps they listened to something finer yet. It was only in their enchanted silence that I thought I heard it. Now and then the wind held its

breath and the oak leaf castanets ceased, and then for a second I would be sure of it; an elfin tinkle so crepuscular, so gossamer fine that it was less a sound than a thought, the ringing of snow crystal on snow crystal as the feathery flakes touched and separated in the frost-keen air. It surely was there and the beech trees heard it and stood breathless in solemn joy at the sound.

The chickadees were very happy that day. Little groups of half a dozen flipped gaily from tree to tree, bustling awkwardly and jovially about picking up food continually, though it is rarely possible to see what they get as they glean from limb to limb. Winter is the time for sociability, say the chickadees, and they welcome to their number the red-breasted nuthatches that have followed the season down from the Maine woods.

The chickadee in his cheery endeavors to take his own in the way of food where he finds it does some surprising acrobatic feats, but they are almost always clumsy and you expect him momentarily to break his neck. Not so the nuthatch. He runs along the under side of a limb with his back to the ground as easily as he would run along the upper side. He comes down the smooth trunk of a pine head down, just as a squirrel does, his feet seeming to be reversible and to stick like clamps wherever he cares to put them. All the time his busy little head is poking here and there with sinuous agility and his slim, pointed bill is gathering in the same invisible food, no doubt, that the chickadee is after. And as he eats he talks, a quaint high-pitched, nasal drawl of yna, yna, yna, that gets on your nerves after a while and you are glad to see

him let go his upside-down hold, turn a flip-flap in the air, and light on another tree some distance away. I think Stockton got his idea of negative gravity from watching the nuthatches. If I were mean enough to shoot one I should as soon expect to see him fall up into the sky as down to the earth, so usually regardless and defiant is he toward the proper and accepted force of gravity.

Quite prim and upright as compared with these shifty wrigglers is the third boon companion of these winter day expeditions, the downy woodpecker. You are not so apt to find him as the other two, for his work is deeper and more laborious and they are likely to flit flightily away while he still drills and ogles. Yet you can hear him much farther away than the others, and it is not difficult to slip quietly up and see him at his work.

Prim and erect he stands on some rotten stub, his stiff tail-feathers jabbing it to hold him steady, his head now driving his nail-like bill with taps like those of a busy carpenter's hammer, anon speeding up till it has almost the effect of an electric buzzer. Then he looks solemnly with one eye in at the hole that he has made, prods again eagerly and pulls out a fat white grub, gulps it, and goes hop-toading up the stub looking for more probe possibilities. Or perhaps he writes scrawly Ms. in the atmosphere as he flits jerkily over to the next tree that pleases him.

Thus though not of a feather these three flock together in the biting cold of winter days and seem to be cheery and courageous if not exactly contented. They are all hole-born and hole-building birds and when night overtakes them they know well where to find wind-proof hol-

low trunks where they may snuggle, round and warm in their fluffed out feathers till dawn calls them to work again.

Yet, with all the yearning of the trees and the joy of the woodland creatures in the prospect of snow it ended in no snow storm. All day long the sun shone palely through a frost fog and the frost crystals sprang out of it at the touch of the icy wind and tinkled into snowflakes right before your eyes. The wind swept a feathery fluff together in corners but at nightfall when the moon shone through a clearer air and a near-zero temperature the crystals had begun to evaporate, and by morning hardly a trace of them was left. To-day it is April-like; to-morrow we may have zero weather again and before these words get into print perhaps the yearned-for snow will have come and

with its kindly shelter covered the succulent green things of pasture and woodland that need it so badly.

It is wonderful, though, how they stand freezing and thawing and yet remain green, firm in texture, and wholesome. The birds of the air have feathers which they can fluff out and make into a down puff for a winter night covering. Here in the pine grove is the pipsissewa starring the ground with its rich green clumps. It is as full of color and sap, seemingly, as it was in July when its fragrant wax-like blossoms starred its green with pink. No cell of the fleshy texture of its green leaves is broken nor is there a tarnish in their gloss. Its seed-pod stands dry on a dry scape in place of its flower, but that alone shows the difference between summer and winter. Yet it stands naked to the north wind

protected by neither feathers nor fur. Who can tell me by what principle it remains so? Why is the thin-leaved pyrola and the partridge berry, puny creeping vine that it is, still green and unharmed by frost when the tough, leathery leaves of the great oak tree not far off are withered and brown?

Chlorophyl, and cellular structure, and fibro-vascular bundles in the one plant wither and lose color and turn brown at a touch of frost. In another not ten feet away they stand the rigors of our northern winters and come out in the spring, seemingly unharmed and fit to carry on the internal economy of the plant's life until it shall produce new leaves to take their places. Then in the mild air of early summer these winter darers fade and die. Here in the swamp the tough and woody cat-o'-nine-tails is brown and

papery to the tip of its six-foot stalk. The blue flag that was a foot high is brown and withered alongside it, yet the tender young leaves of the *Ranunculus repens* growing between the two and not having a tenth of their strength are tender and young and green and unharmed still. The first two died at a touch of the frost. The buttercup leaves have been frozen and thawed a score of times without hurt.

You might guess that the swamp water has an elixir in it that saves the life of the repens; but how about the *Ranunculus bulbosus*, European cousin of the repens? That grows on the sandy hillside, and even the root tips that extend below its little white bulb have been frozen stiff a score of times since the woody stemmed goldenrod beside it dropped dead, sere and brown, at the first

good freeze. Yet to-day in the smiling sun I found the young leaves of the *Ranunculus bulbosus* green and succulent and unharmed of their cellular structure, and so I am sure they will remain, under the snow or bare, as the case may be when the first yellow bud pushes upward from that white bulb where it is now patiently waiting the word. Our botanists who study heroically to find some minute variation in form that they may add another Latin name to their text-books might study these variations in habit and result and tell me the reason for them. I 'd be glad to buy some more books on botany; but none that I have seen have so far within their pages any explanation of this puzzle.

WHEN THE SNOW CAME

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I HAVE N'T seen my friend the cotton-tailed rabbit for some days. All the winter, so far, he has frequented his little summer camp on the southern slope of the hill, well up toward the top, among the red oaks. Here in a little tangle of tiny undergrowth and brown leaves, with a fallen trunk for overhead shelter, you might find him any forenoon. He had backed into this place and trampled and snuggled till he had a round and cosy form just a bit bigger than himself, where the sun might warm him until he was drowsy and he could sit in a brown ball with his feet tucked beneath his fluffy fur, his ears laid along his back, and his eyes half closed in dreamy contentment.

I could step quietly up the path and see him sometimes a second before he saw me, but only for a second. Then his dream of succulent bark of wild apple trees and other delicacies of the winter woods would pass with a single thump of his sturdy hind feet as he struck the earth a half dozen feet away from his snug lodging, and more thumps and the bobbing of a white tail would carry him out of sight in a flash. He bobs and thumps just as a deer does when you surprise him in the forest, and flies a white flag in just the same way. Both go jerking away like sturdy but nervous sprites, and though a deer in the forest is supposed to be the epitome of grace, I can never see it. The startled fawn and the startled bunny are both too eager to get on to be graceful.

We have just had some touches of real

Here in a little tangle of tiny undergrowth and brown leaves, with a fallen trunk for overhead shelter, you might find him any forenoon

winter and these have sent the cottontail to the seclusion of his burrow, where he lacks the health-giving warmth of the sun, it is true, but where he is snug and comfortable beneath the frost line. Like the rabbit most of the wild creatures of the wood seem to endure the snow with cheerful philosophy, but I am convinced that few of them like it. It hides their food from them, and if it is deep or a strong crust makes its surface difficult of penetration its long-continued presence mean short rations or even starvation and death. The squirrels have some stores within hollow trunks and these are available at any season, but much of their winter food is buried helter-skelter beneath brown leaves and too deep snow shuts them off from it. The fox must range farther and pounce more surely, for the field mice which are his bread

and butter are squeaking about their usual business in pearly tunnels where he may not reach them. The woodchucks are tucked away for the winter, the skunks are dozing fitfully on short rations, hungry but inert, and even Brer Rabbit does not venture out of his hole for days at a time when his enemies, winter and rough weather, are upon him.

Yet if the furred and feathered people of pasture and woodland have no occasion to love the snow it is far different with the trees and shrubs and tender plants of the out-door world. These have yearned for it with love and a faith that has rarely lacked fulfilment. They talked about it incessantly, each in the voice of its kind, the big forest oaks with the cheery rustle of sturdy burghers, the little scrub oaks with the tittle-tattle of small-natured folk. Let the wind blow north or

south or high or low the birches sang a little silky song of snow and the pines hummed or roared to the same refrain. Then it came, "announced by all the trumpets of the sky," as Emerson says, but muted trumpets that blared without sound. The eyes saw the flourish of them, the nose mayhap whiffed the rich odor of the storm. You could see it in the sky and feel the light touch of its unwonted air on your cheek, but you could not say that the wind blew north or blew south when the culmination of signs made you sure of it. The storm may bleat along the hillside like a lost lamb or roar high above in the clashings of the infinite skies after it is well under way, but always before it begins is this little breathless pause between the dying of one wind and the birth of another.

So it was that the first of this snow

came to the woods. In the hush of expectation there was a certain feeling of awe. The trees felt it as much as I did and stood as breathless and expectant. Instead of clearly defined clouds, the whole air seemed to thrill with the dusky gray presence of a spirit out of unknown space, of whose beneficence we might hope, but of whom we were not without dread. And so the dusk of the storm we hoped for gloomed down on us in the breathless stillness and tiny flakes slipped down so quietly that the touch of their ghost fingers on my cheek was the first that I knew of their actual coming. The pine boughs high over my head caught these first flakes and held them lovingly and let them slip through their fingers only after many caresses, and soon through all the pine wood you could hear a little sigh that was a purr of content-

ment in the first faint breathing of the north wind bearing many flakes.

Thus the snow comes to the woods. You can see its portent glooming in the sky for hours beforehand, smell it in the rich, still air and feel its touch on your cheek. When I stepped out from under the cathedral gloom of the space beneath the pines, I found the air full of flakes whirling down from the north and the field white with them.

Standing in the midst of the storm in the field, you have a chance to see something of its color, for after all falling snow is only relatively white. Looking toward the dense, dark foliage of the pine wood, you see it at its best, especially across the wind, for the contrast is most vivid and the color most distinct. Each individual flake is so distinct and so white, from those near you, which go

scurrying earthward as if in a great hurry, to those of the distance, which float leisurely down. Look again up the wind toward the gray of the hard-wood forest and you shall find the falling hosts almost as gray as the wood which they half blot out. But if you would see black snow, you have but to lift your eyes to the leaden gray sky out of which, as you see them from below, flakes float in black blots that erase themselves only when they lie at your feet. In open wells in the deep wood you can see this still more definitely as you look up, a black snow falling all about you, to be changed to spotless white by some miracle of contact with the earth.

In the deep woods, too, you hear the cry of the snow, not the song of the trees in the joy of its coming, but the voices of the flakes themselves, their little shrill

cries as they touch leaf or twig. To the pines that held up soft arms of welcome and clasp them close and will not let them go away though each bough is weighted down, they whisper a soft little cooing word that is surely "love" in any language. No wonder it is warm under pine boughs in a snow-storm. The great trees glow with the happiness of it and the radiance of their delight filters down to you as you stand beneath. The flakes seem to love the bare, smooth twigs of the hard-wood maples less, they give them just a pat and a gentle word of greeting as they go by, and they touch the birches almost flippantly. Among the fine pointed tridents of the pasture cedars, however, they linger somewhat as they do among the pines, though their song here is of jovial friendship only, with even something waggish about it.

They linger in groups among the cedar boughs for awhile, but often start up in gentle glee and shake themselves clear, leaving the tree in a sort of blank dismay until more of their fellows come to take their places. There is a little swish of fairy laughter as they do this, as of the snickering of fat bogles as they play pranks in the white wilderness.

But it is over on the oak hillside where the red and black oaks still hold resolutely to their dried leaves that the cry of the snow will most astonish you. It is not at all the rustle of these oak leaves in a wind. It is an outcry, an uproar, that drowns any other sound that might be in the wood. It is impossible to distinguish voices or words. It is as if ten thousand of the little people of the wood and field and sky had suddenly come together in great excitement over something and

were shouting all up and down the gamut of goblin emotion. After I have stood and listened to it for a minute or two I begin to look at one shoulder and then the other fully expecting to see gabbling goblins grouped there, yelling to one another in my very ears. Here with closed eyes you may easily tell the quality of the snow about you by the sound. Each sort of flake has its distinct tone which is easily recognized through all the uproar. At nightfall of this first snow of ours it happened that in the meeting of northerly and southerly currents which had brought the storm, the north wind lulled and the south began to have its way again. This gave us at first a great downfall of big flakes that seemed to blot out all the world in an atmosphere of fluff. Then, evidently, the warmth in the upper atmosphere increased for the

big flakes gave way to a fine fall of rounded sleet. Then, indeed, we got outcry the most astonishing in the oak wood. The voices shrilled and fined and all crepitation was lost in a vast chorus of a million peeping frogs. Nothing else ever sounded like it. It was as if a goblin springtime had burst upon us in the white gloom of the oak wood and all the hylas in the world were piping their shrillest from the boughs.

I went home. I think it was time. People used to get among goblins at dusk in this way in the old country and when they got back from goblin land they found that they had been gone three years, and I did n't care to stay away so long.

During the night the sleet changed to rain which froze as it fell, and in the morning the snow everywhere was but

an inch or two deep and covered with an icy crust that broke underfoot with a great noise and effectually scared away any woodland thing that you approached, provided it had powers of locomotion. Fox or crow, partridge or rabbit, must have thought that Gulliver was once more walking in among the Lilliputians with his very biggest boots on. Never were such thunderous footsteps heard in my wood, at least not since the last icy crust. Frozen in the icy surface were the trails that had been made when the snow was soft, the squirrel's long, plunging leaps with his hind feet dropping into the hole his front feet had made, giving something you might mistake for deer tracks, except that they went back up the tree. You saw where the crow had dropped to earth and trailed his aristocratically long hind toe, with its incurv-

ing claw. The crow's foot is fine for grasping a limb, but it does not fit the ground well. On the other hand, the trail of the ruffed grouse which may lie beside it shows an ideal footprint for walking woodland paths, the hind toe stubby nailed, short but firm, and the whole print well planted and fitting the earth.

These and many more I found modeled in ice, but the trails that interested me most were those beneath the crust, the long tunnels that wound here and there, intersected and doubled and made portions of the fields and forests for all the world like the blue veining of a white skin. These were the trails of the shaggy-coated, crop-eared, short-legged, short-tailed meadow mouse. This firm crust had opened to him the opportunity of safety in paths that had been before dangerous in the extreme. He knew where

chestnuts had lain open to the sky for months, but he dared not go into the open path to get them. Fox, cat, skunk, weasel, hawk, owl, crow, all watched the paths and the edges of the thick grass for him. He must burrow or die. So he does burrow all the year through, just beneath the surface, in dirt if he must, under light leaves and brush and matted grasses by preference, for there he may go the more easily and quickly to his food. His eyesight and hearing are good, and he moves like a little brown flash when he has to go into the open.

If I wish to see him I watch well-worn footpaths through matted grass and leaves. Here his tunnels end on one side of the path and begin on the other and he takes the chance of crossing this risky opening to sun and sky as often as he feels he must, but he wrecks the speed

limit every time he does it. So quickly does he go that you cannot be sure what has happened; there was the stirring of a leaf on one side and a grass stem on the other and a sudden vanishing touch of brown between the two, but which way it went or whether it went at all is doubtful. So, too, his tunnels come down and open at the water's edge by the meadow brook and if you are patient and have rare luck you may see him swim across. Here trout and mink are on the watch for him. His numbers need to be great if, with all his caution and agility, he is going to survive all these huntsmen, and they are great. He may breed at two months of age and have many litters a season and his progeny, if unchecked, soon swarm. All the meadows are full of them this year, but it is only when such a snow as we now have comes that

we have a chance to see what they may do.

In the summer-time they stick close to their meadows, living on succulent roots and stems. They are especially fond of tuberous roots of the wild morning-glory, which they store by the pound in their grass larders near their nests. But under the welcome cover of the snow they push their excursions far afield and their netted-veined trails come even to your house itself, though they rarely dispute the wainscoting with the house mouse. Now and then they do, however, and I fancy they have no trouble in holding their own against their slighter and more aristocratic cousins. When they do come you will know their presence by the extraordinary noise of their gnawing. Once a stone crusher, no less by the sound, got into my garret, and after one

sleepless night I set the biggest trap I had, expecting to get the most enormous brown rat that ever happened, if not some new and more elephantine rodent. What I caught was a well-grown field mouse, and the noise passed with him.

The rain which produced this thunderous and telltale snow crust brought a new and gorgeous growth to the trees. From trunk to topmost twig, each was garmented in regal splendor of crystal ice. I had been in goblin land when I fled, at twilight, from the eerie shrilling of bogle hylas among the oak trees. I had come back into fairyland with the rising sun. The demure shrubs, gray Cinderellas of the ashes of the year, had been touched by the magic wand and were robed in more gems than might glow in the wildest dreams of the most fortunate princess of Arabian tale.

Ropes of pearl and festoons of diamonds weighed the more slender almost to earth. The soft white shoulders of the birches drooped low in bewildering curtsey, and to the fiddling of a little morning wind the ball began with a tinkling of gem on gem, a stabbing of scintillant azure, so that I was fain to shut my eyes with the splendor of it.

Then came the prince himself to dance with them, the morning sun, flashing his gold emblazonry through their gems till the corruscation drowned the sight in an outpouring of fire. The princesses all began to speak as he came among them, a speech wherein dropped from their lips all jewels and precious stones. Sunbursts of diamonds fell from dainty young pines and ropes of pearls slid from the coral lips of slender birches. The babble fell all about their feet in such

ecstasies of brilliant speech, such tinkling of fairy laughter as the wood had never yet seen. Brave revels have the little people of the forest under the moon of midsummer night, no doubt, but never could they show such royal, dainty splendor as their own trees did this midwinter day when the sun shone in upon them after the ice storm.

THE MINK'S HUNTING GROUND

THE MINK'S HUNTING GROUND

I WISH I could have seen the country about the great spring which goes by the name, locally, of "Fountain Head" the year that the clock stopped for the glaciers hereabout. That year when the last bit of the ice cap, that for ages had slid down across southeastern Massachusetts and built up its inextricable confusion of sand and gravel moraines, melted away, would have shown a thousand great springs like it, bubbling up all through the region, almost invariably from the northerly base of gravelly cliffs over which the sun can hardly peep at noonday, so steep they are. Here they flow to-day in the same mystery. Why

should these unfailing springs rush forth so steadily, be the weather hot or cold, or the drought never so long or so severe? Why should their temperature like their flow be changeless, summer or winter?

I sometimes believe that their waters filter through deep caverns from far Arctic glaciers continually renewed. Perhaps to have looked at them before the changing seasons of more thousands of years had clothed the gravel and sand with humus, grown the forests all about and choked the fountains themselves with acres of the muck of decayed vegetation no one knows how deep, would have been to see them with clearer eyes and have been led to an answer to the questions. Now I know them only as bits of the land where time seems to have stood still, fastnesses where dwell the lotus

eaters of our New England woods, where winter's cold howls over their heads, but does not descend, and where summer's heat rims them round, but hardly dares dabble its toes in their cool retreat.

Progress has built its houses on the hills about them, freight trains two miles away roar so mightily that the quaggy depths tremble with the vibrations, and you may sit with the arethusas in mossy muck and hear the honk of the automobile mingling with that of the wild geese as they both go by in spring. Yet the one makes as much impression on the land and its inhabitants as the other. The lotus eaters know not Ulysses; if he wants them for his ships of progress he must capture them by force and tie them beneath the rowers' benches, else they return. Even the temperature of those

last days of the ice cap seems to have got tangled in the spell and to dwell with the mild-eyed melancholy of the place the year round. In midsummer the thermometer may stand at 120 in the quivering nooks where the sun beats down upon the sandy plains above; the waters of the fountain head are ice cold still, and give their temperature to the brook and its borders. In midwinter the mercury may register twenty below, and the gales from the very boreal pole freeze the pines on those same sandy plains till their deep hearts burst; the waters that flow from those mysterious fountains will have no skim of ice on their surface.

From what unfathomed depths the waters draw their constancy we may never know, nor on what day may well forth with them some new form of life bred on the potency of their elixir. To-

day is freezing cold and now and then snow-squalls whirl in among the swamp maples, eddying in flocks as the goldfinches do, yet the surface of the biggest pool where the waters well up is covered with the vivid green of new plant life. Millions of tiny boreal creatures swim free on the cool surface, plants reduced to their simplest terms, born for aught I know in depths below like those

> "Where Alph, the sacred river, ran
> Through caverns measureless to man
> Down to a sunless sea,"

whence they ooze in the seeping of the upward current to our shores. No one has here found the seeds of these stemless pinheads of green that lie flat on the surface and send down for a wee fraction of an inch their two or three tiny root hairs into the water.

No one can say they are apetalous or monosepalous or sporangiferous or call them other hard names in Latin having reference to their flowering or fruiting for we may not say that they flower or fruit at all. These minutest Lemnas give us no sign of stamin or spore, of carpel or indusium, yet they multiply by millions and cover the surface of the spring pools whence they depart constantly with the outflowing current, voyaging gayly down Brobdingnagian rapids to the sea. The time of year when it is winter in the sky above and on the bank a few feet up the hillside, when all green life except that which grows with its roots in this magic water from the deep caves of earth is either killed or suspended, seems to be their time for growth.

They grow a little, to a certain stage when perhaps a plant covers surface to

the size of a pinhead and a half, then split and become independent plants with a tiny root hair apiece. Brave equipment this for facing the January gales and frost of a northern winter. Yet they sail forth from the home pool as confidently as liners from the home port and rollick all along down the stream, making harbor in every tiny bay and collecting a fleet in each eddy. What potency of perpetual spring they sow as they traverse all the ways that wind in and about the levels below the fountain head we do not know, any more than we know what elixir vitæ dwells in the waters on which they are borne, yet something makes the region the lotus land of creatures of the wild where they linger on unmindful of their vanished kindred.

Out of the rich vegetable mould of ages, in the cool, moist shadows grow the rarer

New England orchids in the summer, and the rarer migrant birds of our summer woods find asylum here for their nests and young. In the winter the ruffed grouse comes here to drink, finds gravel for his crop always bare and unfrozen on the hillside where the first seepings of water come forth, and no doubt gets an agreeable change of food in the succulent green things of the shallows. Several of these birds cling to the place, nor can I drive them away by simply flushing them. They circle and come back to the brook margin or its immediate neighborhood every time.

Where the swamp maples have grown large on the bank and lifted the soil with their roots high enough to form miniature dry islands the mink have built their burrows and thence they go forth to hunt the region all about, but especially

You may get a glimpse of the weasel-like head of one lifted above the bank as he sniffs the breeze for game and enemies

the brook and its tributaries, most ravenously. If you are patient, fortunate, and the wind is right you may at dusk get a glimpse of the weasel-like head of one lifted above the bank as he sniffs the breeze for game and enemies. In that light his fur will look black though it is really a pretty shade of brown, but you will not fail to see the white streak which runs from his chin downward. But, though you may not see the animal himself you cannot, if there is snow on the ground, fail to see his slender, aristocratic track with its clutching claws, for the mink is a desperate hunter and always hungry. All is fish that comes to his net, — trout, turtles, toads, snails, bugs, or anything he can find in the brook that seems in the least edible.

The semi-aquatic life of the enchanted region is sadly destructive of other life,

and I feel little pity for the mink or the weasel, sleek and beautiful wild creatures though they are, if they in turn fall into the steel jaws which the trapper sets for them in the narrow passes all up and down the stream. It is the common lot of the woods and only the swiftest and most crafty can hope to escape it. The mink devour the trout, and they, seemingly innocent and beautiful enough to have come up, water sprites, from that unknown underground world whence well the crystal waters in which they live, are as greedy and irresponsible in their diet as the mink themselves. Like them, when hungry they will devour the young of their own species and smack their lips over the feast.

The trout will eat anything that looks to be alive either in the water or on the surface. I often amuse myself in sum-

mer by biting small chunks out of an apple and dropping them in, to see the trout swallow them as ravenously as if they had suddenly become vegetarians and had all the zeal of new converts. What the Jamaica ginger preparation of the brook world is I don't know, unless it is watercress. That grows, green and peppery, all up and down the brook the year through. Perhaps the trout go from my green apple luncheon over to that and thus join the remedy to the disease.

One of the trout titbits is the gentle little caddice worm, grub of the little miller-like caddice fly that flits in at the open window of a May night and lights on the table under the glare of your lamp. He dwells on the bottom in these same pure waters and he has much to do to defend himself against the jaws of his

nimble hunter. He is but a worm that crawls, so speed may not save him. His skin is tender and he has no weapon of defense save his brain which one would hardly think adequate in so humble a creature. Yet if you will sit on the brink and watch what goes on in the cool depths you will see how cleverly and in what a variety of ways he and his kindred, for there are several varieties, have become skilled in self-defense. The little fellow has, like most grubs, the power to spin fine silk. This would count for little though he spun a whole cocoon, for the trout would swallow him, silken overcoat and all. But he does better than that. He collects bits of log from the bottom and winds these in his silken warp till he has knotted himself firmly within a log house. There is no incentive to a trout to eat twigs from the bottom, so the

defenseless caddice worm is passed unnoticed. He is snugly rolled in silk within his rough house and moves about by cautiously putting out a leg or two and crawling with the logs on his back. Another variety uses small pebbles instead of logs. Taking a stone from bottom in the swift running water of a tiny rapid to-day I found it covered with little gravel barnacles that clung like limpets to the proverbial rock.

I could pry them off only by the use of considerable force and even when I did this the wee bits of gravel, carefully fitted together in a hemisphere, still remained, bound in strong bands. Within the hollow was the little creature that had built the structure, his silken netting still holding him snug within his rock castle, so much brain has this seemingly blind and helpless worm for the preservation of

himself. But more than this, the builder and riveter of this adamantine castle has other use for his silken bands than to bind stone or to weave himself a silken garment against the damp weather at the brook bottom. He is a fisherman as well, and stretched between two stones near by or perhaps hanging over the edge of the larger stone on which he dwells is his net, built funnel-form with the larger end toward the oncoming current, the smaller closed with silken netting, all carefully spread to catch tiny creatures slipping down stream with the current, on which the net-builder, castle-dweller, may feed. These homely, home-building, home-keeping fishermen lead an humble and pious life compared with that of the rakish, cannibalistic trout, and they have their reward. Some day, before the spring is very old, they will give up casting

their nets, build their house firmer, though still leaving a chance for a circulation of water, and fall asleep. They will awaken to glide heavenward out of the swirl of the current, veritable white angels with downy wings which they will spread and on which they will soar away to a new world which is as different from that in which they bound themselves in logs or granite to escape their enemies as is the old-time orthodox heaven from the world in which the preachers of it lived.

IN THE WHITE WOODS

IN THE WHITE WOODS

THE snow came out of the north at a temperature of only twenty degrees above zero, yet, strange to say, for some hours it came damp and froze immediately on every tree-trunk or twig that it struck. The temperature remained the same all day and through the night, but the streak of soft weather somewhere up above which was responsible for the damp snow soon passed away and frozen crystals sifted down that had in them no suspicion of moisture. Yet these tangled tips with those already frozen firmly to the trees, and made a wonderful snow growth the whole woodland through. The next morning it hung there untouched in the crystal stillness and as the

woodland people waked they might well have rubbed their eyes, for they had found a new world.

It was a mystical white world that had crowded in and mocked the slender growth of all trees and shrubs with swollen facsimiles in white. The northerly side of tree-trunks, large or small, showed no longer gray bark or brown, rough or smooth. Instead, fluffy white boles rose from the white ground and divided into white limbs, which separated again into mighty twigs of white. The dark outlines of bare trees, the delicate tracery of gray and black that massed day before yesterday in the exquisite dark shades of the winter woods, existed only as a faint definition of the world of whiteness which had descended upon us in a night.

Upon each shrub and tree had grown

another, its fellow in exact reproduction of line and curve, only swollen to forty times the size. This enormity of limb and twig shut off all vistas. Where it had been easy to see through the bare wood, the brush merely latticing your view and softening up the middle distance with gray or pink or brown, according to the growth, now the gaze was tangled in a narrow grotto heavily decorated with buttress and baluster, with fluting, frieze, and fillet, with mantel, moulding, mullion, and machicolation, and beat in vain against a solid wall of alabaster just beyond. The greater pines were pointed cones of white, each limb drooping with the weight of snow to its fellow below, and the hangings of the outer tips joining to form a surface wherein miniature domes, set strangely askew, yet massed in curves of superb

beauty to the making of the symmetrical whole.

In it all there was no feeling of weight. As a matter of fact it pressed the smaller shrubs and trees well down toward earth. The narrow woodland path was barred with a woven portcullis of white that had swung down from either side. Here and there in the open the smaller pasture cedars were bowed to the ground, doing reverence to the garment of mystic purity with which the earth was sanctified as if for the passing of the grail. In a moment you expected to see some Galahad rise from his knees with shining face, take horse beneath the marble towers of this woodland Camelot, and ride down white lanes in holy quest. In the deep wood the seedling pines broke through the drifts like gnomes from mines of alabaster, whimsical green faces show-

ing beneath grotesque caps and shoulder capes that were part of the whelming snow. Yet it all looked as light and airy as any structure of the imagination, seeming as if it might rise and float away with a change of mood, some substance of which air castles are built, some great white dream poised to drift lightly into the realm of the remembered, as white dreams do.

In woodland pathways where the trees were large enough on either side so that they did not bend beneath the snow and obstruct, all passage was noiseless; amongst shrubs and slender saplings it was almost impossible. The bent withes hobbled you, caught you breast high and hurled you back with elastic but unyielding force, throttled you and drowned you in avalanches of smothering white. To attempt to penetrate the thicket was like

plunging into soft drifts where in the blinding white twilight you found yourself inexplicably held back by steel-like but invisible bonds, drifts where you felt the shivery touch of the cold fingers of winter magic changing you into a veritable snow man, and as such you emerged. It was more than baptism, it was total immersion, you were initiated into the order of the white woods and not even your heel was vulnerable.

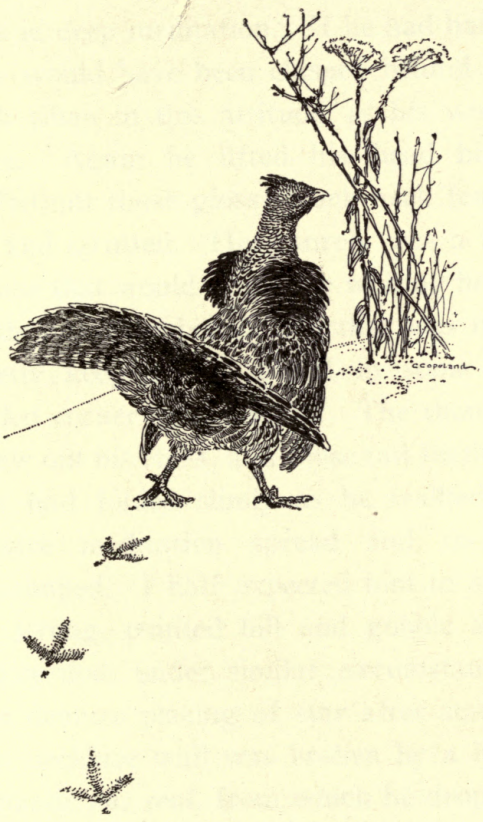
Thus panoplied in white magic, my snowshoes making no sound on the fluffy floor of woodland paths, I felt that I might stalk invisible and unheeded in the wilderness world. The fern-seed of frost fronds had fallen upon my head in fairy grottos built by magic in a night. These had not been there before, they would not be there to-morrow. To-morrow, too, the magic might be gone,

but for to-day I was to feel the chill joy of it.

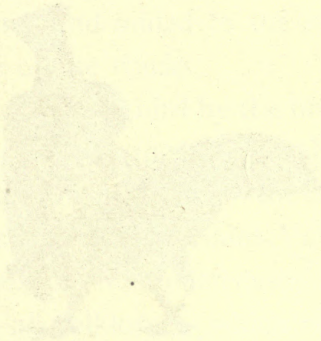
A ruffed grouse was the first woodland creature not to see me. I stalked around a white corner almost upon him and stood poised while he continued to weave his starry necklaces of footprints in festoons about the butts of scrubby oaks and wild-cherry shrubs. He too was barred from the denser tangle which he might wish to penetrate. He did not seem to be seeking food. Seemingly there was nothing under the scrub oaks that he could get. It was more as if, having breakfasted well, he now walked in meditation for a little, before starting in on the serious business of the day. He too was wearing his snowshoes, and they held him up in the soft snow fully as well as mine supported me. His feet that had been bare in autumn now had grown

quills which helped support his weight but did not take away from the clean-cut, star-shaped impression of the toes. Rather they made lesser points between these four greater ones and added to the star-like appearance of the tracks.

I knew him for a male bird by the broad tufts of glossy black feathers with which his neck was adorned. It was the first week in February, but then Saint Valentine's day comes on the fourteenth, and on this day, as all folklore — which right or wrong we must perforce believe — informs us, the birds choose their mates. My cock partridge must have been planning a love sonnet, weaving rhymes as he wove his trail in rhythmic curves that coquetted with one another as rhymes do. His head nodded the rhythm as his feet fell in the proper places. Now and then he bent forward in his walk as one



He lifted his head high, fluffed out those glossy black neck feathers and strutted



does in deep meditation. If he had hands they would have been clasped behind his back when in this attitude, as his wings were. Again he lifted his head high, fluffed out those glossy black neck feathers and strutted. Here surely was a fine phrase that would reach the waiting heart of that mottled brown hen that was now quietly keeping by herself in some secluded corner of the wood. The thought threw out his chest, and those tail feathers that had folded slimly as he walked in pensive meditation spread and cocked fan-shaped. I half expected him to open his strong, pointed bill and gobble as a turkey does under similar circumstances. The demure placing of star after star in that necklace trail was broken by a little fantastic *pas seul*, from which he dropped suddenly on both feet, vaulted into the air, and whirred away down arcades of

snowy whiteness and vanished. I don't think he saw me. He was rushing to find the lady and recite that poem to her before he forgot it.

On the white page of the path that lay open under groined arches of alabaster no foot had written a record for many rods, then it seemed as if from side to side stretched a highway. Back and forth in straight lines had gone a creature that made a lovely decorative pattern of a trail, a straight line firmly drawn as if with a stylus, on either side at a distance say of three-fourths of an inch tiny footmarks just opposite each other, while alternating with these and nearer the middle line were fainter and finer footprints.

Here the tiny deer-mouse had drawn his long tail through the snow, whisking from stump to stump in a quiver of excitement

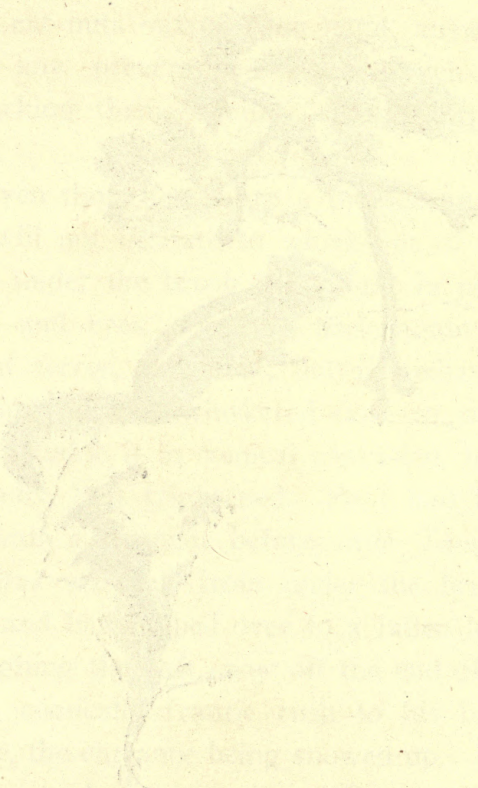
lest an enemy gobble him up, shooting across like a gray shuttle weaving this exquisite pattern that is like that of a dainty embroidery on a lady's collar. How he can gallop so regularly and make his tail mark so straight is more than I can tell. Indeed, so sly he is and so swiftly does he go that I have never seen him make it. Beside this tiny pattern the marks where the gray squirrel has leaped across are like those of an hippopotamus on a rampage and the print of my own snowshoe was as if there had been a catastrophe and a section of the sky had fallen.

Along with the tiny mouse tracks were those of our least squirrel, the chipmunk. There is no difficulty about seeing him. He will almost come if you whistle for him. If you will camp near his burrow you may teach him to come

and eat nuts out of your hand, answering any prearranged signal, such as whacking them together or chirping to him.

Even though you are a total stranger he will not hesitate to whisk out of his hole under the brush heap right in your face and eyes, whisking back again in great terror, no doubt, but immediately putting out his whiskered nose to sniff and wrinkle it in comical confusion, half friendly, half frightened. So I had but to wait a moment before little *Tamias striatus* was out from under the brush pile and had flipped over to a fallen log, ploughing the soft snow off the end of it in a comically frantic rush to his hole there, the entrance being snowed up. He was in and out again in a jiffy, standing on his hind legs and peering over the log and making noses at me, jumping to the

He was in and out again in a jiffy



top and whirling and jumping down again, and then flashing out and kicking up crystals in a rush across the road to another hole under another brush pile, his scantily furred half tail erect and as humorously vivacious as everything else about him. The chipmunk when he thinks he is going to be captured and is filled with great fear — half of it being, I believe, fear that he wont be — is the most delightfully comical little chap that grows in the woods. If he 'd only keep as wild as that after he is tamed I 'd like one for a pet.

Down in the open meadow where the unfrozen brook ran black in its banks of snow, touched only here and there with the green of luxuriant watercress, I found the trail of the crows. Not one was in sight and there was no sound from them anywhere. It was as if the snow had

covered them under and they were unable to break through it. Here, however, was evidence to the contrary. Surely they had breakfasted, and no doubt well. They had marched all up and down the low banks, and where a snowy island lay in midstream they had promenaded it from one end to the other. Here and there I could see where they had stepped into shallow water and waded. The marks of muddy claws in the white snow were much in evidence where they had jumped out again. Just as summer bathers " tread for quahaugs " in the summer shallows south of the cape, I could fancy them feeling with their toes for shell-fish and prodding for them with long bill when found. But they had had a salad, too, with breakfast. I could see where they had pulled out the watercress all along and cropped it down to the

larger stems. Even in winter weather when the snow lies deep the crow knows where to find what is good for him.

Where the path wound round the brow of the hill and the birches stand, their granaries still full of manna for the wandering bird, it seemed again as if my plunge into the white thicket had baptized me with invisibility. Of a sudden the air was full of the sound of wings and a flock of tree sparrows that must have numbered hundreds swung about my head and charged the snow-covered birches. Their dash shook some snow off and a few lighted, the others swinging off and having at them again. This time all found a footing and began to feed eagerly on the seeds from the tiny cones, scattering the birdlike scales in flocks far greater than their own.

I had stopped stock-still at the sound of

their wings, and they took no more notice of me than if I had been a snowed-up fence post or a pasture cedar. I tried to count them, but it was not easy. They seemed to twinkle from twig to twig like wavelets in the sun, and though their garb is sober their movements dazzle. Just as I would get a group on a single tree nicely tallied they flashed as one bird over to another tree, and mingling with their fellows there spoiled the count. I finally estimated, rather roughly, that there were three hundred of them, a half of a light brigade of as merry fellows as I wish to meet. They twittered jovially and musically among themselves, and now and then one essayed a little *sotto voce* song which he never could finish because immediately his mouth was full.

Once or twice some inaudible order seemed to thrill through the flock and they

whirled upward as if a single muscle moved every wing, swung a short ellipse and lighted again, often in the same trees. As they worked into the birches almost over my very head I could see every marking on them; the black mandibles, the lower yellowish at the base, the reddish brown crown and the back streaked with the same color, with black, and a yellowish buff, the wing coverts tipped with white and the grayish white breast with what looks like an indistinct dark spot in the center. In a kaleidoscopic flock of three hundred or more it is not easy to give every bird even a passing glance, but I am quite sure there were other than tree sparrows present. I seemed to see birds without the faint dark spot in the breast. A few, I know, had a distinctly rufous tint there, and I fancy swamp sparrows, a few of which winter hereabouts, and per-

haps other birds for sociability's sake, were with my winter chippies.

The shaking of the snow from the trees and their gleaning among the birch cones had scattered the little seeds which they love so well all about on the snow and soon they followed them. The surface a little before had been white. Before the birds were ready to come down it was spiced so liberally with the seeds and scales that they had shaken down that it was the color of cinnamon. Then with one motion the flock dropped like autumn leaves and began a most systematic seed hunt in which they left no bit of the space unsought. Yet when they were gone you would hardly find two tracks that crossed; they hopped in winding parallels that never went over the same ground a second time, leaving figures much like the mazes which schoolboys of

long ago used to draw on their slates. They came almost to my feet and I was beginning to feel that my fancy of invisibility was very real after all when with a twitter of alarm and a single united action they whirred into the air and vanished over the treetops.

I turned away in chagrin. The magic was destroyed, evidently, and in turning I saw the cause. Just behind me in the snow with quivering tail and green eyes glaring accusingly was the family cat. He was hunting far from home, but I saw contemptuous recognition in his eyes and I knew he was thinking that here was that great, clumsy creature that was always scaring away his game.

THE ROAD TO MUDDY POND

THE ROAD TO MUDDY POND

TWO days of greedy south wind had licked up the crisp snow till all the fields and southerly slopes were bare. Then came the lull before the north wind should come back, a lull in which you had but to sniff the air to smell the coming spring; its faint perfume crisped with a frosty odor that lured the senses like a flavor of stephanotis frappé. It was a day that tempts a man to take staff and scrip and climb the hills due south to meet the romance the two days' wind has brought from far down the map, perhaps from Venezuela and the highlands that border the banks of Orinoco. By noon the north wind will be driving it back again, though bits of it will still be tangled in southerly facing corners of the hills.

Such a day is fine for cedar swamps. The boggy morasses under foot will be firm with the winter's ice still, but the warm wind has swept all things clear of snow. Into the most tangled depths you may penetrate with at least firm footing. Where in summer the treacherous mosses wait to let you through into black depths of soft muck that have no bottom, you may walk in safety on the way that the winter has laid for you.

It is not a time of year to find new things, this season of mid-February, and yet I had hardly faced the bewildering sun a mile before, seeking the cool depths of a hemlock-clad northern hillside to rest my eyes from the glare, I found a yellow birch all hung with fluffy tassels, as if the wine aroma of the air had fooled it into foliage. Now the yellow birch is not exactly rare in our woods, here south-

west of Boston, but it is rare enough to be called occasional. Where the *Betula alba* is as common, almost, as the grass under foot, the *Betula lutea* may not occur once in a square mile. I know it only on cold northern hillsides or in dense swamps where cool springs bathe its roots all summer long. There the silvery yellow, silky shreds of its outer bark mark its trunk as a thing of beauty, winter or summer. You feel like stroking these curls as if they were those of a flaxen-haired youngster lost in the deep woods and brave but a bit troubled and in need of comfort from one who knows. That is the only impression the yellow birch had ever made on me in all my greetings of it, yet here it was wearing a semblance of young leaves in this wine-sweet February air.

Even after the cool depths of the woods

had cured my eyes of the sun glare the illusion remained and I had to climb the tree and pluck some of this foliage before I was sure what it could be. Surely eyes and no eyes have we all, for, in all my life, I had never noticed what happens in winter to the catkins of the yellow birch. Instead of hanging rigid like wee cones, as do those of the white birch, giving up seeds and scales to sprinkle the snow or the bare earth as the creatures of the woods have need of them, these had shed their *fleur-de-lis* scales and then held them fluttering in the wind, each by a tiny thread. On looking at them closely I saw the slim, rat-tail spindle sticking out, its surface file-like with the sockets of seed and scale, but the effect of the whole was that of fluffy tan-colored tassels hung along the twigs. Here and there among these *fleur-de-lis* the round,

flat, wing-margined seeds were still tangled by the two pistils which still remained, seeming like tiny black roots, or something like those hooks by which the tick-seed fastens to you for a free ride.

Surely the wilderness families have strongly marked individuality. Both the white and yellow birches must hold their seeds and scatter them little by little the whole season through, that they may have the better chance to germinate and continue the race, and I can never see why they should not do it in the same way. But they do not. Perhaps this infinite variability is arranged wisely so that people who blunder about with half seeing eyes may now and then have them opened a little wider and so be pleased and teased into blundering on. Another season I shall watch the yellow birches and find,

if I can, on what winter date their catkins blossom into tassels.

The gravelly ridges of the woodland I tramped as I faced the golden sun again are singularly like waves of the sea. They roll here and rise to toppling pinnacles there and tumble about in a confusion that seems at once inextricable and as if it had in it some rude but unfathomed order. Surely as at sea every seventh wave is the highest; or is it the ninth, or the third? Just as at sea, the horizon is by no means a level line. Wave-strewn ridges shoulder up into it and now and then a peak lifts that is a cumulation of waves all rushing toward a common center through some obscure prompting of the surface pulsations. Sometimes at sea your ship rises on one of these aggregations of waves and you see yawning in front of it a veritable gulf; or the ship

slips down into this gulf and the toppling pinnacle whelms it and the captain reports a tidal wave to the hydrographic office, if he is fortunate enough to reach it. So along my route southward the terminal and lateral moraines, drumlins, and kames rolled and toppled and leapt upward till they had swung me to a pinnacled ridge whence I looked down into a stanza from the Idylls of the King. Along a way like this once rode scornful and petulant Lynette, followed by great-hearted Gareth, newly knighted, on his first quest;

" Then, after one long slope was mounted, saw
Bowl-shaped, through tops of many thousand
pines
A gloomy-gladed hollow slowly sink
To westward — in the deeps whereof a mere,
Round as the red eye of an eagle owl
Under the half-dead sunset glared; — "

That is the way Tennyson saw it, and the counterpart of the gulf, out of which looked the round-eyed mere, lay at my feet. Long years ago some first settler, lacking certainly Tennyson's outlook, stupidly cognizant only of the worst that his prodding pole could stir up, named the wee gem of a lake "Muddy Pond." Here surely was another man with eyes and no eyes. Round the margin's lip, summer and winter, rolls the bronze green sphagnum, its delicate tips simulating shaggy forest growth of hoary pine and fir. Nestling in its gray-gold heart are the delicate pink wonder-orchids of late May, the callopogon and arethusa. Here the pitcher plant holds its purple-veined cups to the summer rain and traps the insects that slide down its velvety lip and may not climb again against this same velvet, become suddenly a spiny chevaux-

de-frise. All about are set the wickets of the bog-hobble, the *Nesœa verticillata,* which in July will blossom into pink-purple flags — decorations, I dare say, of wood-goblins who play at cricket here on the soft turf of a midsummer-night's tournament.

Of a summer day this tiny bowl is a mile-deep sapphire, holding the sky in its heart. When thunder clouds hang threatening over it, it is a black pearl with evanescent gleams of silver playing in its calm depths; and always the dense green of the swamp cedars that rim its golden bog-edge round are a setting of Alexandrite stone such as they mine in the heart of the Ceylon mountains, decked with lighter pencilings of chrysoprase and beryl. And some man, looking upon all this, saw only the mud beneath it! Probably he trotted the bog and only knew

the wickets of the *Nesæa verticillata* were there because they tripped him. And I 'll warrant the goblins, sitting cross-legged in the deepest shadows of the cedars, waiting for midnight and their game, mocked him with elfin laughter — and all he heard was frogs.

Looking down upon it this brilliant February day, with a tiny cloud drawn across the sun, it was a pearl. The winter and the distance made the bog edging pure gold in which it shone with all the white radiance of its opaque, foot-thick ice. Anon the sun came out and what had been a pearl gathered subtle fires of blue and red in its crystalline heart and flashed opaline tints back at me that changed again as I plunged down the hill toward it, and it lay a Norwegian sunstone shooting forth fire-yellow glows as the rays of the sun caught the right angle. Nor was

the ice less beautiful when I stood on it. Here opaqueness wove sprightly patterns with crystalline purity. The surface was smooth under foot and yet these patterns rose and fell in the ice itself, and it was hard to believe they were not carved intaglio and then the surface iced over to a level. It was no prettier ice than I had crossed on the big pond, but its setting brought out the beauty.

Ice grown old, after all, is far more beautiful than young ice. Character is built into it. Living has taught it the highest form of art, which is to repeat beauty without sameness. What designs might the makers of floor coverings win from this surface if they would but study it, and how trite and tame in comparison seem their tiresome interweaving of square and circle and their endless repetition!

This solid floor, woven by winter witchery, goes on through the spongy surface of the bog, mingling with it, yet by some necromancy never interfering with its own intricate patterns of growth. The sphagnum fluffs up through it with its delicate fiber unharmed. The pitcher plants sit jauntily holding their ewers to the sky, filled with ice instead of water, to be sure, but uncracked and waiting in rows as if for bogle bellboys to rush with them to unseen guests. I found one flower-scape with its nodding head still persistent. The seed pod had cracked along the sides, but the umbrella-like style was still there, opened and inverted, and it had caught many of the seeds that the pod had spilled and was holding them for a more favorable season, without doubt.

Everywhere the solemn cassandra

pushed its black twigs up through the moss and held its leathery leaves, brown and discouraged, drooping yet persistent. The cassandra always reminds me of thin, elderly New England spinsters who enjoy poor health. It is so homely and solemn; even in joyous June it never cracks a smile, but is just as lugubrious and sallow and barely holds on to an unprofitable life. And all about, indeed in many places crowding the very life out of it, grow these brave, virid, white cedars. You 'd think it might catch geniality from them. Their footing is as precarious as its own. Of course, now, the ice has set all things in its firm grip, but in summer there is little enough to hold up the swamp cedars and it is only by entwining their roots and growing them firmly together in a mat that they are able to keep their sprightly uprightness. So closely are

the young trees set on the edge of their grove that it is difficult to penetrate their intertwining branches, and even when you have passed this barrier you find the trunks so close that often there is no room to go between them. Here all branches have passed and the straight trunks run upward in close parallels making all their struggle at the top. And a struggle it has been indeed for all that are now alive. You may note this by the bare poles of those that have lagged behind a little in the fight and lost the magic touch of sunlight on their tops. These are dead and bare, and their companions have so immediately taken up their slender space that you wonder how the dead ones ever got so far as they did. It is a very solemn temple under these cedars. The living wall the dead within the catacombs and the sighing of

the motionless leaves above your head still leaves you in doubt. It may be trees that sorrow for dead neighbors or gasp in the struggle to retain their own breathing space.

Little obstructs your passage, now that the firm ice is underfoot, unless it is the too close set tree trunks. Goldthread and partridge berry creep in the moss that mounds about the very stumps of the cedars, but no other vine or shrub seems to have the vitality to grow here, or if it had it has wisely used it to flee to more sunny uplands. Not even in tropical jungles have I seen the struggle for existence so fierce as it is among these too closely set swamp cedars. One in ten eventually survives and makes a marketable growth. Other things bring them to disaster than the choking crowding of their neighbors, however. Here and

there you can see big trees that lurch in strange fashion, some this way and some that. This is most often true of a pine that by some chance has grown among them. The cause is the uncertain footing of the slimpsy bog. As they get heavier and taller they cannot find sufficient anchorage in the yielding wallop beneath their roots, and sooner or later a wind comes that tips them over. But I found in places among the sheltering larger trees, groups of young ones, cedars, that could have suffered from no wind, they were so well protected and walled round by their elders. These were laid down in brief windrows all in the same direction, and I wonder still what force accomplished it. If it had been a tropical jungle I should have said that here a hippopotamus wandered up out of the depths and back again, or here an elephant fled

from some retired statesman, but these are not beasts of our frozen forests.

In one place was another tropical suggestion that was a bit startling. This was the cast skin of a snake that must have been four inches in diameter. It was only the white bark of a dead birch that had fallen and rotted, as to its heartwood, all away, but the tougher bark remained, dangling in white folds just as a snake's skin does when cast.

But this is not the place to see the swamp cedars at their best. You are on their gloomy side now. Toward the vivifying sun they turn every cheerful atom within them and as you look down on them as the sun does from some near by southern ridge you get the full effect of their close-set masses of living green and realize the enormous virility within them. It seems to me that our toughest tree

here in eastern Massachusetts is the red cedar. It grows on storm-swept rock cliffs where nothing else but lichens can seem to find a foothold. Yet close behind it I class this dweller in the rich, moist peat bogs. I find that many botanists do not differentiate this tree that I call swamp cedar from the red cedar, *Juniperus virginiana*. Yet it is nearer this than it is to the arbor vitæ which is the so-called cedar of the Maine woods. But it is not the red cedar in one important particular. It does not have that wonderful red fragrant heart-wood that the red cedar has. That alone, it seems to me, should give it a separate standing botanically. Then its leaves are flatter and more of the arbor vitæ type than those of the red cedar. And there you have it; but I know what happened. Long ages ago, when staid and sober ever-

greens were more frisky than they are now some particularly handsome young arbor vitæ lass came down from the north woods and met and loved one of our husky red cedars. How could she help it? Then there was a secret trip to Providence, or whatever place was the Gretna Green of those days, and the elopers settled down in Plymouth County, or perhaps here in Norfolk. That would account for my white cedar, and it is the only way I can do it.

I was two miles further toward the Plymouth woods and was broiling a chop for my dinner on the fork of a witch-hazel stick over the lovely clear flame of dry white pine limbs, when I came across the second new thing of my experience in the winter woods. That was black snow. It was on the northerly edge of an open meadow, a spot so tangled with wild rose

and other slender shrubs that it was next to impossible to penetrate it. For some reason the south wind had failed to carry off all the snow here, and a thin coating of it lay on the ground. There was a bit of open water on the edge of the tangle, and I noticed that this was covered with a black coating. Going down to look closer I found that the snow as far as I could look into the meadow was covered with this same surface, making it fairly black. It looked quite like the soot from black coal, but when I poked at it with my finger to see if it smutted it hopped nimbly away. The open pool and the snow all about it was covered with tiny black fleas or some similar skipping minute insect. I was curious about these tiny black creatures, and I folded many of them carefully in a leaf of my note book, creasing the edges firmly so that

I might keep them tight, and put them in my scrip. I intended to put them under a microscope and see how many legs they had for all this wonderful skipping; but they had too many for me. When I got home the paper was blank. They had all skipped.

AMONG THE MUSKRAT LODGES

AMONG THE MUSKRAT LODGES

I ALWAYS know the sound of the east wind as it comes over the Blue Hills for the twanging of the bow from which winter has shot his Parthian arrow. The keenest it is in all his quiver of keen darts, for it penetrates joints in one's armor that no gale from Arctic barrens has been able to reach, that no fall of snow or of temperature has weakened. Facing it to-day and feeling its barbs turn in the marrow of my breastbone as I crossed Ponkapoag Pond I began to wonder how it fared with my friends the muskrats who were wintering in the very teeth of it over on the northwest shore. And so I turned my shoulder to the blow and my face to the bog where tepees in a

long line spire conically out of the brown grasses on the bog edge, where the pickerel weed flaunted blue banners all summer long.

The thermometer marked a temperature of but a few degrees below freezing, but it was the coldest day of the winter. The bite of the wind off Hudson's Bay is as nothing to the chill which the Arctic sea-water folds in its unfrozen heart as it sweeps from polar depths down the west coast of Greenland, along the Labrador shore, round Newfoundland and down again, shouldering into Massachusetts Bay; the reserve corps of the winter's assault, the Old Guard plunging desperately to its Waterloo in the face of all-conquering spring. This chill the east wind had caught up from the green depths of the surges he tossed, and made it the poison of the points which he drove

desperately home. Face this wind for a day and you shall feel the venom working long after you have sought shelter, nor shall even the cheer of a big open fire drive it easily from your bones.

Yet you may draw from the chill this cheer, if you will, that no longer is the worst yet to come; it is here and soon the prospect must mend. It seems odd to think that some day next July we shall sniff this frigidity drawn from the depths of the boreal current, borne on the wings of the east wind, and revel in the intoxicating ozone with which it soothes our heat-fevered nostrils.

Over on the bog edge are twenty-seven lodges, built of bog turf and roots, dead grass and rushes, almost any rubbish in fact which Mussascus, as Captain John Smith called him, has been able to get in the neighborhood. Each has a

foundation of some sort; one a stump submerged in the muck, another a rude framework of alder sticks which the muskrat cuts with his strong, chisel-like teeth and brings in his mouth as a beaver would; others variously upheld, but all so placed that the entrance may be beneath the water and beneath the ice also, however thick it may freeze.

Little does the muskrat care for my marrow-piercing east wind. I 'll wager that he never knows it blows, for rarely indeed at this time of year does he put his nose out where he might feel it. His stairway leads from the under-water entrance to a cosy and comfortable nest lined with soft grass where he and his fellows cuddle. The mud-smeared, water-soaked material of their walls is frozen to adamant. It is porous enough in spots to give them air for breathing but does

not let the cold wind enter. It is as snug and safe a place as any one could devise. An enemy must break through from without and long before he can smash the frozen walls Mussascus has slipped into the water and gone his way beneath the ice, first to another tepee, or if driven from that on again to his burrows in the hard bank a thousand feet away.

Bending my ear close to the nearest lodge I rapped sharply on the rough wall and listened. There was no sound. Again I rapped and my knock was all that disturbed the silence within. Outside the frozen marsh grasses sawed silkily one on another and the frost crystals that the wind was sweeping from the thick white ice shrilled infinitesimally as they slid by, but no sound came from the lodge. Evidently no one was at home. At the next lodge it was different. The

rap was succeeded by a second of breathless silence, then there was the sound of scrambling, and as I watched the dark clear ice that always obtains just about the lodge I saw three silver gleams shoot athwart the clear space and vanish under the opaque ice just beyond. Three Mussascuses had fled, their dense, dark, close-set under fur holding the air entangled in its fine fuzz which is impervious to water, thus accounting for the gleam.

Like the fur-seal the muskrat has an outer coat of rather coarse hair and an undervest of much finer, more silky texture. This provides an air space which enfolds him, however long he remains under water, and its chill may not reach him nor can the moisture. Only the soles of his feet and the very tip of his muffle, the nose-pad, are bare. His ears are set down within his fur, and when he is be-

neath the surface each holds an earful of air that catches under-water sounds and transmits them as faithfully as it does the sounds of the upper world. He swims by vigorous "dog-paddle" motions of his hind feet, which are large and furnished with stiff, coarse hair that answers for a webbing between the toes. Moreover, these feet are "hung-in" a little in a peculiar club-footed way that makes his gait on land an awkward shamble, but which allows them to "feather" as an oar does in swimming, thus giving his propulsive apparatus the greatest possible efficiency.

People who know Mussascus best differ about the use of his tail. I have never seen him use it except as a very efficient steering oar, but I have been told that he sculls with it as a fish does with his, and thus helps his progress. It is admirably

adapted for either purpose, but it is a tail that does not look as if it belonged to any fur-bearing animal. It is almost as long as the muskrat himself and has never a hair from butt to tip. Instead, it is furnished with small stiff scales which might just as well be those of a snake. It is flattened sidewise and trimmed down to almost a knife-edge at top and bottom, and the muskrat uses it most efficiently.

But however well adapted their feet and tails are for swimming and their fur for keeping them warm and dry beneath the ice, it would seem as if the three little soft-furred, brown chaps that I had just driven from their snug wigwam had a far greater problem to solve than that of warmth or locomotion. How were they to breathe in the water beneath this foot-thick coating where was no hole to give them an outlet to the air? In a few

minutes their lungs must have a new supply of oxygen, and if let alone they are able to get it in a rather curious fashion. Coming up beneath the ice, they expel the vitiated air, making a bubble which in a short time absorbs new oxygen from the ice and water; then they re-breathe it and go on.

In the early autumn when the ice is thin and clear you may capture Mussascus by first driving him from his lodge, then following him as he swims, a silvery streak beneath the ice, till he makes that telltale bubble. Then go up and hit the ice sharply over the bubble and you drive the little fellow away from his own breath and drown him. But you would be unable to play any such mean trick as this along the Ponkapoag bog edge now, for the muskrats are abundantly provided for, and I believe they did it themselves.

Here and there along by their tepees you find open breathing holes. These, I am quite sure, the little fellows keep open, just to be able now and then to take a glimpse at the upper world, though they do not need them otherwise. But that is not the provision which I mean. As far along the bog front as the tepees go there are everywhere big white air-bubbles. From the tepees out into the pond they show in many places for a distance of a hundred feet or more, and then cease. Nowhere else in the pond are these bubbles and I believe the muskrats have stored them here in their various excursions as relays, providing against just such folk as myself, who might come along, force them from their homes, and drown them beneath the thick ice covering. Thus provided, the three that I had driven out would have no trouble in reaching

the most distant tepee or the higher bank beyond the bog edge, where are their summer burrows.

Nor need they trouble their minds the winter through about provisions. Some curious skater or perhaps a would-be fur dealer has been along at one end of the bog and broken into a number of houses and scattered others all to bits. A long thaw enabled him to do this, else the winter had kept them so safe from vandals that only a heavy ax or pick would give entrance. Among the ruins that this human earthquake caused are fat roots of the yellow pond lily, the spatter dock, as long as my arm. It looks as if some of the houses were half built of these petrified reptiles broken in chunks, scaly looking remnants of a previous geological age. These are the muskrat's bread, or perhaps we might better say his

potatoes. Rough and forbidding as they look they are white and crisp inside, and though their taste is as flat and insipid as that of a raw potato to you and me the muskrat votes them delicious and satisfying. The bottom of the pond is stored with them and he has but to dive and dig, and he even buttresses his winter wigwams with them.

If he wants something a little more spicy there are spots in the bog, now safe under water and ice but within easy reach of a submarine like himself, where grow the pungent roots of the calamus, the sweet flag, of which he is very fond and which, when dried and sugared, most humans like to nibble. Stored all along the shallows are his shell-fish, the fresh water mussels whose thin shells he can easily tear open and whose white flesh he finds exceedingly toothsome. These, too,

are as available in winter as in summer. Indeed some of his houses are built in the autumn, not so much for winter homes as restaurants where he may dine in seclusion on these very mollusks. Quite a distance from the bog, over in a shallow part of the pond, is a bed of these mussels with a flat-topped rock near by rising above the surface. Here last fall the muskrats built a lodge, right on the rock, which they used for this purpose. The first skaters kicked this lodge to pieces. It was fairly crammed with the empty shells of many a rare feast, showing that here Mussascus had undoubtedly entertained his friends in true Bohemian style.

So, while I shivered in the searching east wind on the sky side of the ice, the muskrats were well fed and comfortable in a region of even higher temperature, a country where the spring, which we say

comes up out of the south, but the muskrat knows wells up out of the ground beneath, is already at his door. Its warmth is in the bog below and has softened and even melted the ice all about the tepees. The ice on the pond is a foot thick still, but the water beneath it is thrilled with this same potency and you have but to stir it to sniff its fragrance. Below the pond the brook which is its outlet splashes over the long-abandoned sills of what was a gristmill dam in the days of the early settlers. Here in spite of the keen lances of the wind and its roar in the frozen maples overhead, I heard the soft tones of the coming season in every babble of the brook. All the air was full of a fresh, inviting fragrance which the water gives off as it flows. All the pond is full of it beneath the ice already, and the muskrat breathes it in his every excursion under

the crystal depths. Soon he will abandon the winter houses, which as soon as the frost leaves them will sag and flatten and begin to sink into the bog itself, building its outer edge a little firmer here and there, and thus helping it in its yearly encroachment on the pond itself. As the ages have gone by, Mussascus has been a pretty potent factor in this encroachment.

As the beaver has been a maker of ponds and a conserver of streams, holding and delaying their waters with his dams, so the muskrat has helped in the making of meadows and the sanding and grading of pond edges. The first is done by his winter nests, the second by his summer burrows which start under water at the pond edge and slant along near the surface for thirty to fifty feet. Many cubic yards of sand and loam are dug from these burrows and spread along

in the shallows. His river habits are strong upon him in this work, for he usually makes a delta of entrances, three or four leading up into the same passage which often has a wee exit above water, near the edge. Here if you are particularly fortunate you may in midsummer see his young poke their noses up, longing for a peek at the great world, before they are big enough to swim out into it. Here, too, weasel and mink sometimes find entrance and devour his family. But there are three litters a year, as a rule, so the occasional weasel serves to keep down a too great increase in the population.

His greatest enemy, however, is man, who so pollutes the streams with sewage and factory refuse that no self-respecting muskrat can live in many of them, and who hunts him for his fur for the making of automobile coats. Yet in the case of

my Ponkapoag Pond friends man's hand for once is for him rather than against. His home there is now a part of the park system and he may be shot or trapped only under penalty of the law. This has been so for some years now and I think it explains the numbers of the winter lodges which are this year greater than ever before.

THICK ICE

THICK ICE

IN the winter the pond finds a voice. The great sheet of foot-thick, white ice is like a gigantic disk in a telephone, receiver and transmitter in one, sending and receiving messages between the earth and space. Probably these messages pass equally in summer, only the instruments are so tuned then that our finite ears may not perceive them; for the surface of the pond has its water disk in the summer no less than in winter, but an exquisitely thinner and finer one.

Taking to-day my first canoe trip of the year about the edges where the imperative orders of the coming spring have opened clear water for a half-hundred feet, I could not help noticing this thinner disk.

The west wind blew keen, but lightly, and had crowded the ice over toward the eastern shore, leaving me free northwest passage in sunny shallows where no ripple disturbed. Every dip of the paddle threw drops of water on the surface, drops that shone like diamonds in the warm sun, but sought, always for a time in vain, to reunite with their kindred water. This invisible barrier held them up and they rolled about without wetting it, just as they might have on a glossy disk of metal, though they finally vanished into it. Like the drops the disk was made up of molecules of water, but the fact that these rested on the very summit of their fellows and between them and the air seemed to change their character and give them a property of impenetrability.

It is this disk of water on water that holds up the summer water striders, lean

and ferocious-looking insects that skip about on the surface, the tips of their long legs denting it but never being wet. There is a big black land spider that lives on the water's edge summers, who is husky and heavy, yet will run along the surface, galloping and jumping just as if on a dry and sandy beach and neither falling in nor wetting his feet.

When I see the silver dimples that the water strider's feet make in this elastic surface and note this land spider galloping across a cove, the disk of the pond's summer telephone receiver and transmitter becomes very real to my eyes. Very likely the under-water people, mullet and bream and perch, read these messages in summer and know in advance what the weather is going to be. If not, what is it that stops their feeding and disturbs them before any rumble of the approach-

ing thunderstorm has reached my ears? Perhaps in this way they learn of other universe happenings, if such are the subjects of messages that pass, though I am not sure of this, for such information as I have been able to intercept has always referred to approaching meteorological conditions.

They come to my ears only in winter, after the ice has reached a thickness of a foot or so, these promptings out of unknown space. Sometimes you need to be very near the receiver to note them. It is not possible for a mile-square, foot-thick telephone disk to whisper, yet often it grumbles only a hoarse word or two at so deep a pitch that you would hardly know it was spoken. The lowest note on a piano is shrill in comparison to this tone, audible only when the ear is within a few feet of the ice. But there are other

times when the winter ice on the pond whoops and roars, and bellows and whangs as if all Bedlam were let loose and were celebrating Guy Fawkes day. A mile away, of a still winter evening, you may hear this and be dismayed, for the groanings and bellowings are such as belong to no monsters of the present day, though they might be echoes of antediluvian battles corked within the earth for ages and now for the first time let loose.

It is all very simple, of course, says my friend the scientist. It is caused by vibrations due to the expanding or contracting of the ice, or the expanding or contracting of a portion of it causing big cracks to run hither and thither. It means simply that a change in temperature is going on.

But does it? Or if so, is that all it

means? I crossed the pond not long ago of a beautiful springlike morning, after the sun had been up for two hours or more. There was then no voice in the receiver other than the gentle thrumming caused by the chopping of the fishermen, making holes wherein to set pickerel traps, nor was there a cloud in the sky. An hour later the soft haze of a coming warm gale spread over the horizon to the southward, and as if at the touch of a key the pond began to speak a word now and then that rapidly changed to full conversation. From the near hilltop where I stood it was as if I had cut in on a telephone line where two giants were eagerly talking under conditions that made the hearing a difficult matter. There was question and answer, query and interruption and repetition and change of tone from a low voice to a shout.

It was humorously like a fellow townsman having trouble with Central so far as inflection went, but there was a quality in the tone which barred the human. You had but to listen with closed eyes to know that here spoke the primal forces of nature. You may hear that same quality in the voice of a gale at sea. I don't mean the shrilling of the wind in the rigging, or the cry of the waters, even, but that burbling undertone of the upper air currents, growling and shouting at one another as they roar by far overhead. An Arabian might say these are the voices of Afrites, journeying through the air to the kingdom of Ethiopia. So even in the bright sun of that springlike morning these solemn voices of the winter ice seemed like echoes of messages superhuman, passing from deep to deep.

At the time I laid the cause to the

changes in temperature produced by the warmth of the morning sun on the thick ice. Yet the uproar began after the sun had been shining for an hour or two, and it ceased within a half-hour. That night came the south blow and a warm storm.

In the whirligig of our New England winter weather the soft rain and strong south wind passed. Then the wind blew strong from the northwest and fair skies and low temperature prevailed for some days, welding the erstwhile softened ice into an elastic surface as resonant as tempered steel. Then came a still warm day in which we had the same increase of temperature under springlike skies as on that previous day. Yet the pond never uttered a word — audible to my listening human ears. Here were the conditions like those of the other message period, yet not a word was said. Even the soft haze which

presaged another south blow filled the sky, so apparently nothing was wanted but the voice at the other end of the line. It was along in the evening that I heard the first call, followed rapidly by a great uproar, so that people heard it in their houses half a mile or more away. Immediately I looked up the thermometer. The temperature had not changed a degree for hours. Yet here were the primal forces telephoning back and forth to one another and fairly making the welkin ring with their hubbub. Surely wires were crossed somewhere on the ether waves, or else the tempers of the primal forces themselves were out of sorts.

I seemed to hear familiar words in their roarings, admonitions to get farther away from the transmitter, requests for strangers to get off the line and other little courtesies that pass current in the

telephone booth; and so for a half-hour they kept it up. It was all very ghostly and disquieting and savoring of the superhuman to listen to it in the night and wonder what it was all about. At last one or the other giant hung up the receiver with a tremendous bang, and nothing more was to be heard but the mutterings of the other, grumbling about it in notes low and tremendously deep.

Before morning the wind was blowing a wild gale from the south, rain was pouring in torrents and we were evidently on the outer edge of a winter hurricane that had been well up the coast, perhaps as far as Nantucket, when the pond began to talk about it. No; I do not think changes in temperature have much to do with it. My explanation for the scientist is that these noises begin with a drop in the atmospheric pressure, a region of low

barometer moving up in advance of the storm. Taking the pressure quite suddenly off the ice would start all the air imprisoned in solution beneath it to pushing upward for a chance to get away. No wonder it groans and whoops with all that wind in its wame.

But privately I am not so sure. We have so many sure-thing theories, and so much definite knowledge to-day that to-morrow is all discredited and cast aside leaving us groping for another theory, that it is just as easy to believe myself eavesdropping at telephone talk between giants. That particular night it sounded to me like Hercules on his way up from Hades with Cerberus under his arm and a bit over-anxious lest the deities fail to have the dog pound ready for him on arrival in the upper regions — but of course that 's pagan myth. Anyway it

was a great uproar. I fancy winter ice makes the same outcry on other ponds, though I never happened to hear it anywhere else.

To-day the ice was quiet enough on my side of the pond, though you could see where it had been at work. With the west wind as team mate it was dredging and grading over on the east shore. This is the every-day winter work of thick ice. It picks up big rocks on the beach and carries them off into deep water or moves them up or down the shore as it sees fit. But always it pushes back the sand and gravel and stones on low shores and steadily builds them up till you find wide shallow ridges between the water's edge and the slope of the land farther ashore. My pond is very young, scarcely three-quarters of a century old, yet it shows marked evidence of this work all along

shore. When ice is thick and the wind strong, especially toward spring when there is apt to be free water along the edge, you may stand by and see the dredging effect at work, see the low, long mound of gravel or sand slide backward up the beach while the edge of the floe crumples and grinds and crumbles, but still moves irresistibly to its work.

Over at Ponkapoag Pond, which is perhaps a hundred thousand years older, the effect of this pushing ice through the ages, working at various levels, has been to produce mounds and dikes almost beyond belief. Moreover, these are placed in such situations that it is plain to see that the water was for the greater part of that long time some feet higher than now. In my first acquaintance with these ridges I thought them dikes raised by modern men, early farmers, perhaps, who thus

for some occult reason banked the pond as they surrounded their fields with the stone fences which last still. No man of to-day, however ardent a farmer, builds these great barriers between field and field. Yet even with the stone walls before the eye it is hard to believe that men built dykes along the pond shore that averaged a hundred feet across and were in some places much more. A ten-foot bank would do, and it was hard to believe that so much labor would be willingly wasted. Yet along the Ponkapoag Pond shore in one place is a barrier many feet high and broad built, not of sand, but of the rough slate rock of the region, thrown together loosely in huge rough blocks and tamped with earth. This is so much bigger than any of the field-enclosing stone walls that it puts the modern farmer quite out of the question, and on finding

it I had pleasant dreams of a prehistoric race of mound-builders who might have preceded the Indians in their occupation of the land and have built these pond embankments for purposes of their own.

Again my scientific friend disapproves my dream theory in well-chosen argument that is very convincing — to him. Nevertheless I go my way with mind equally divided, — between theories as to prehistoric men-mound-builders and the probabilities of the work having been done by that great beaver which, according to the Algonquin legend, made the world out of mud brought up from the bottom of a lake.

Mind you, I am quite convinced that it is the ice which is doing this on the Reservoir shore, but Ponkapoag — that is far enough away to be in the land of

legend and all sorts of wonderful things may have happened on its borders.

Whatever its work, the ice for this winter has nearly completed it. In early December its crystalline structure was that of ferns, laid flat and interwoven, making it strong and elastic. All semblance of these has vanished, and there remains but a loosely adhering structure built like the Giant's Causeway in the north of Ireland of vertical irregular columns jammed together side by side. Moisture is all between these, and if the temperature is below freezing cements them firmly together, and it is safe to walk on the surface. The ice is almost a foot thick still, but let a warm spring sun in on it, and this cement softens, and what seems a firm foundation crumbles and fails beneath your foot. All along the edges to-day the process of disinte-

gration was going on, and you could hear the little seeping swan song of these ice columns as they slid apart and lay flat, making mush ice in the open water where they soon dissolved and disappeared. Thus the ice waits the mandate of the spring. Some day, soon, it will fall apart as if at a word, and vanish, and by that token we shall know that the winter has really gone, and we shall go about in a pleasant glow, listening for the first voice of the spring frogs.

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